

# THE IRON AGE

A Review of the Hardware, Iron, Machine and Metal Trades.

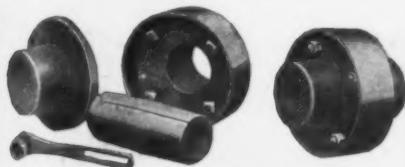
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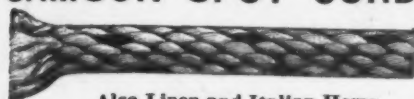
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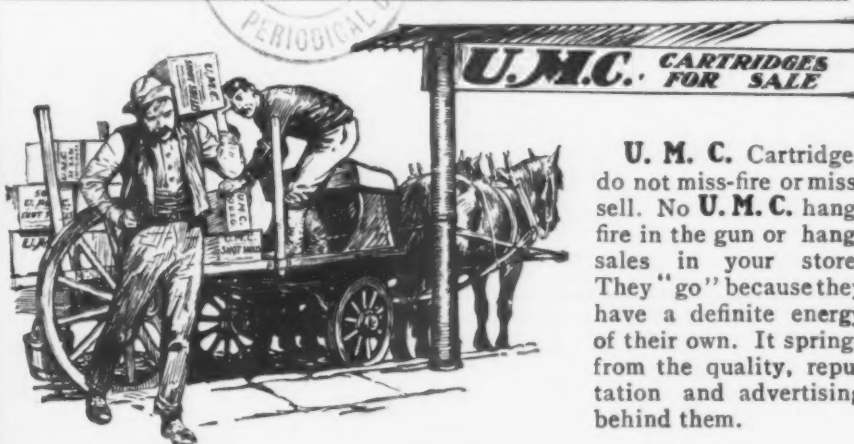
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Advertisement on page 14.



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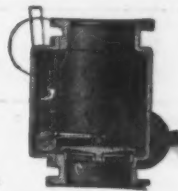
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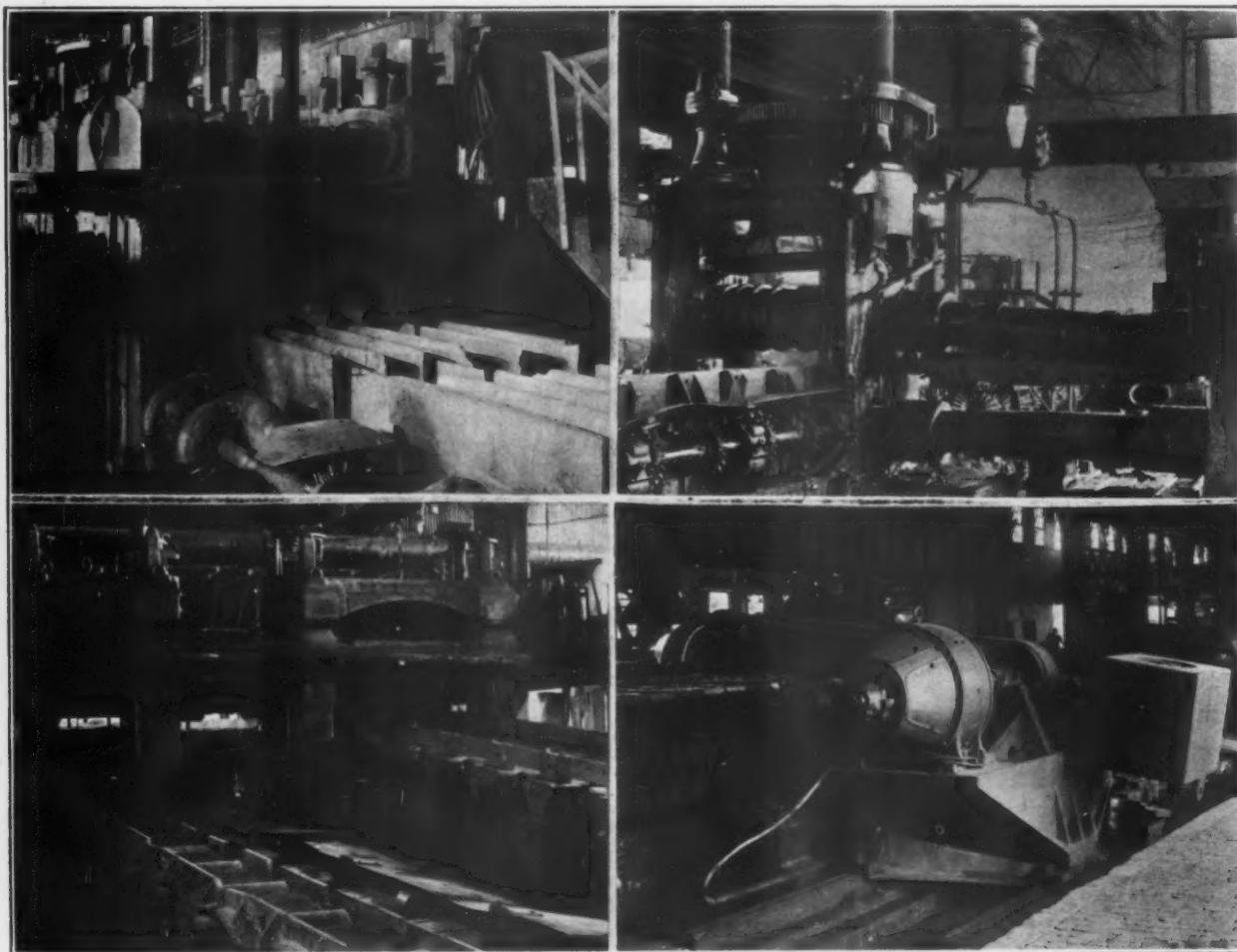
# THE IRON AGE

New York, Thursday, November 9, 1905.

## The Republic Iron and Steel Company's Rail Mill.

The Republic Iron & Steel Company early in the present year added a rail mill to its Bessemer steel plant at Youngstown, Ohio. In laying out this mill some peculiar conditions were encountered which compelled the exercise of a great deal of engineering skill. In the first place, the mill was designed to utilize a 26-inch semicontinuous mill, previously erected for the rolling of billets in the first roughing for rails.\* In the second place, sufficient space was not available for laying out the

The pig iron is remelted in cupolas, of which there are six, blast being supplied by Sturtevant fans directly connected to Westinghouse motors. This method of driving fans has proved to be more efficient than the old method of driving by belts. Molten spiegeleisen from the two spiegel cupolas is run from troughs into a ladle suspended from an electrically driven trolley, which is controlled by an operator on the pouring floor of the converting mill. The converters, two in number, are



The 26-Inch Semicontinuous Mill.  
The Three-High Mill for Second Roughing.

The Two-High Finishing Mill.  
The Hot Saws.

Fig. 6.—Views of Different Portions of the Republic Iron & Steel Company's Rail Mill.

mill in a straight line, and it was necessary to make some of the operations proceed in parallel, introducing transfer tables for handling the rail from one set of tables to another set in proceeding from the semicontinuous mill to the finishing train. The ingenious method by which this is accomplished is clearly set forth in the accompanying illustrations.

### The Steel Converting Works.

In the process of manufacture of Bessemer steel at this plant pig iron is supplied to the cupolas from the company's blast furnaces, there being two located at Youngstown, Ohio, one at Sharon, Pa., and one at New Castle, Pa. It is the intention, however, to use hot metal direct from the furnaces, and plans are now under way with this idea in view.

\* Up to this point the plant was described in *The Iron Age* for October 2, 1902.

each of 10 tons capacity and are served by a ladle crane hydraulically operated, which pours the steel into molds on cars.

The blast for the converters is furnished by an Allis-Chalmers cross compound condensing blowing engine of the steeple type, with steam cylinders 46 and 88 inches in diameter, and air cylinders 76 inches in diameter and 60-inch stroke. Another engine of the same size is now being installed. Steam for operating this engine and all mill engines is supplied by 22 Stirling boilers of 350 horse-power each, set two in a battery. All boilers are stoker fired.

After the ingots have become solidified sufficiently for stripping they are taken to the stripper and the molds are removed. The ingots are placed in heating furnaces or soaking pits, and allowed to become heated to the proper temperature for rolling. There are four four-hole

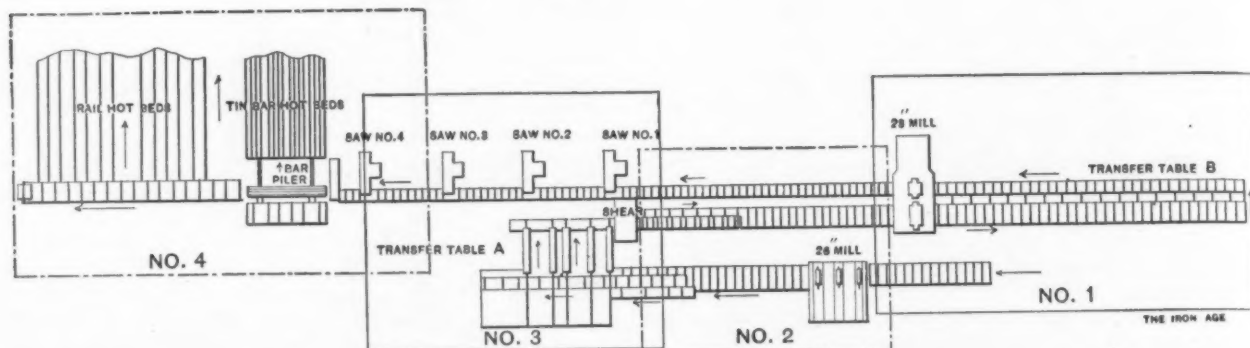


Fig. 1.—Skeleton Plan of the Republic Iron & Steel Company's Rail Mill. Key to Mill Drawings Shown in Greater Detail in Figs. 2, 3, 4 and 5.

soaking pits, to and from which the ingots are handled by two electrically operated cranes.

**The Blooming Mill and First Roughing Train.**

The ingots are reduced to 8 x 8 inch blooms in a 40-inch, two-high mill, driven by a 54 x 66 inch twin revers-

and are then conveyed on tables to the 26-inch mill or first roughing train. From this point the operations are illustrated in Fig. 1, with greater details shown in Figs. 2 to 5.

The 26-inch mill, or first roughing train, is composed of three stands driven from a train of spur gears, the middle gear connected directly to the engine shaft. The first and third pair of rolls carry the piece in a direction away from the blooming mill, while the middle pair of rolls carry the piece toward the blooming mill. The tables are driven likewise, inasmuch as each alternate set

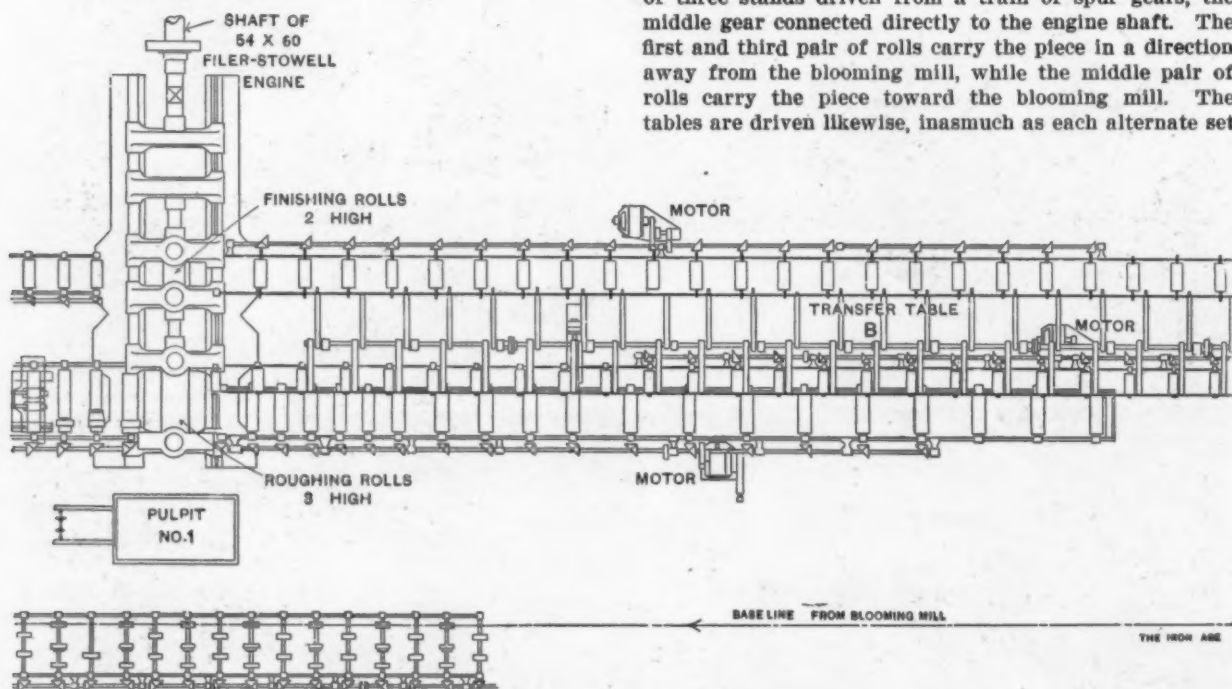


Fig. 2.—Part No. 1 of the Key Plan Shown in Fig. 1.

ing engine, built by the William Tod Company, Youngstown, Ohio. The blooms are cut at the hydraulic bloom shear to the proper length for making three 33-foot rails,

of rolls is driven in a different direction; thus the bloom receives the first pass in the first set of rolls, passes through the large opening in the rolls of the second set

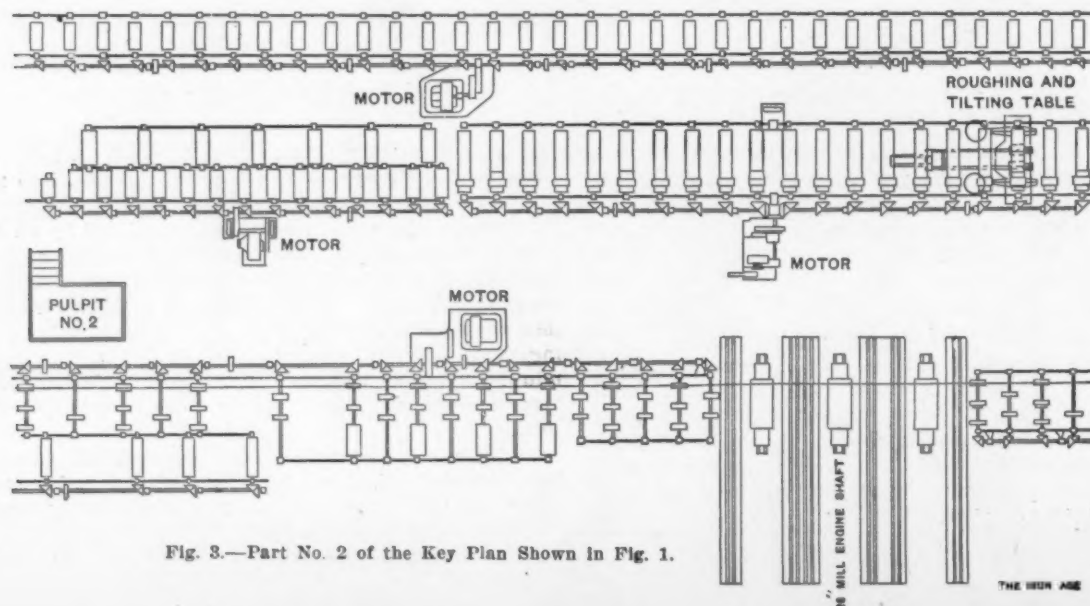


Fig. 3.—Part No. 2 of the Key Plan Shown in Fig. 1.

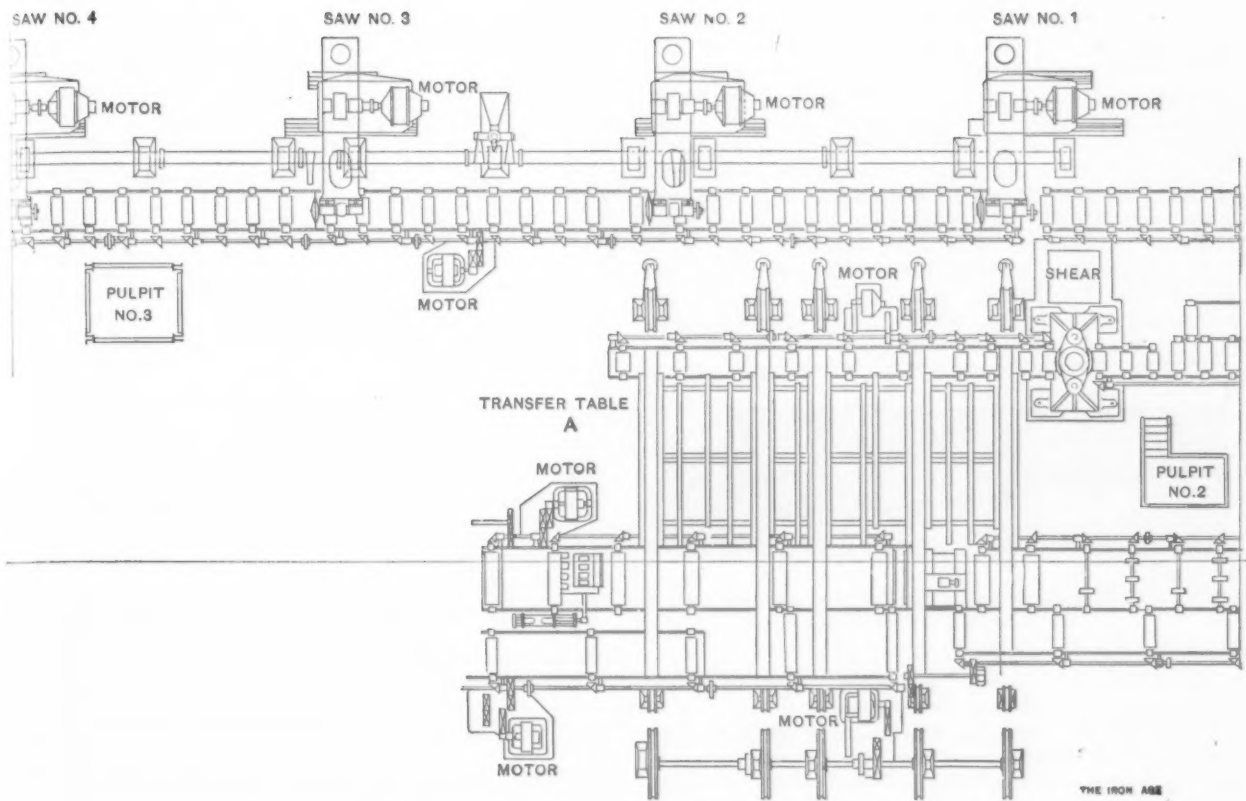


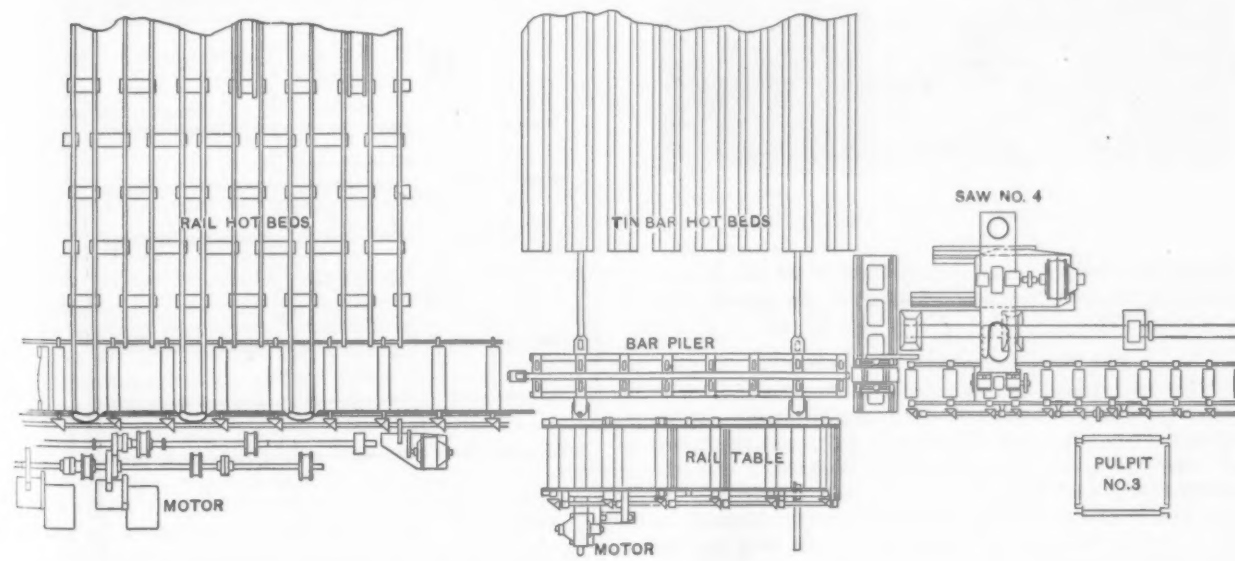
Fig. 4.—Part No. 3 of the Key Plan Shown in Fig. 1.

and receives the second pass in the third set; it then is moved over on the table and passes back through the opening in the rolls of the third set, gets a pass in the middle set and passes through the opening in the first set. The piece is now moved over on the table and gets the fourth pass in the first set, passing through openings in the rolls of sets Nos. 2 and 3, continuing on down the table to the transfer A, shown on Figs. 1 and 4. Here the piece is caught by dogs working in slides attached to ropes, which run over large sheaves keyed to a common shaft. This shaft is geared to a motor controlled from the pulpit shown near the shear. The piece is transferred, or pushed, over on the table in line with the

three-high mill, to which the piece is conveyed. The 30-inch hydraulic shear shown is not used when the mill is running on rails, but is used when rolling tin bars in order to cut the piece into lengths suitable for three 30-foot bars.

**The Rail Mill Proper.**

One 28-inch, three-high mill constitutes the second roughing train and one 28-inch, two-high mill the finishing set, as shown in Figs. 1 and 2. These mills are coupled together and are driven by a 54 x 60 inch single cylinder noncondensing engine run at 80 revolutions per minute, built by the Filer-Stowell Company, Milwaukee, Wis. On the entering side of the mill is a tilting table driven



BASE LINE FROM BLOOMING MILL

THE IRON AGE

Fig. 5.—Part No. 4 of the Key Plan Shown in Fig. 1.



by a railroad type Westinghouse motor. The movements of this table are controlled by hydraulic power, and on it the manipulation of the piece is all done automatically. Five passes are given the piece in the three-high mill. On receiving its last pass, this pass being in the top set of rolls, the piece runs out on a narrow table on the same elevation as the top of the middle roll, which is referred to in Figs. 1 and 2 as transfer table B. A series of arms mounted on a shaft project underneath this table, and when the piece is all out of the rolls the arms are lifted allowing the piece to slide down inclined bars on the table entering the finishing set of rolls where the final pass is given. After being stamped it is conveyed to the hot saws. There are four saws, each independently driven

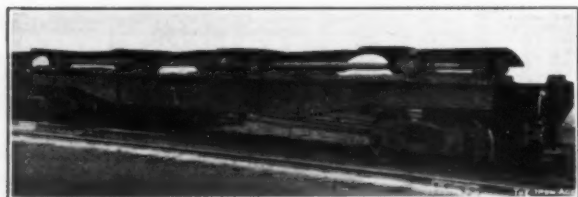


Fig. 7.—Car of Special Design for Transferring Rails to the Finishing Department.

by Westinghouse motors. Fig. 6 shows views of different portions of the equipment just described.

After leaving the hot saws the rails are curved or cambered and delivered on hot beds, where they are allowed to cool and straighten. From the hot beds they are transferred by specially designed cars, one of which is shown in Fig. 7, to the rail finishing department, Fig. 8, where they are deposited on skids convenient to straightening machines. Two transfer cars are used, coupled together and hauled by a narrow gauge locomotive. On top of these cars are two sets of arms, each set being linked to a steam cylinder and all controlled by valves on a manifold, which is attached to the end of the car next to the locomotive. The engineer can here

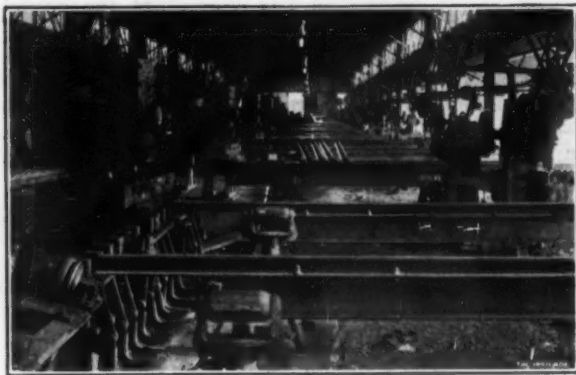


Fig. 8.—Rail Finishing Department.

operate any set of arms to throw rails off one side to straightening beds in the building or on the opposite side to storage beds.

#### The Rail Finishing Department.

This department was laid out with the idea in view of utilizing the limited space to the best advantage. By referring to the plan and elevation, Figs. 9 and 10, it will be seen that this idea has been realized. All the straightening and drill presses are motor driven. The cold saw is also driven by an electric motor. Outside of the building, between the drill press beds and loading beds, there is a table for conveying the rails from one bed to another, or to the cold saw and restraughtening machines. The table is divided into two sections, each driven by an electric motor. Half of the rollers are driven, the other half being idle, thus allowing the rails to be conveyed in opposite directions at the same time. Fig. 11 is a view of the loading beds, where the rails are loaded for shipment.

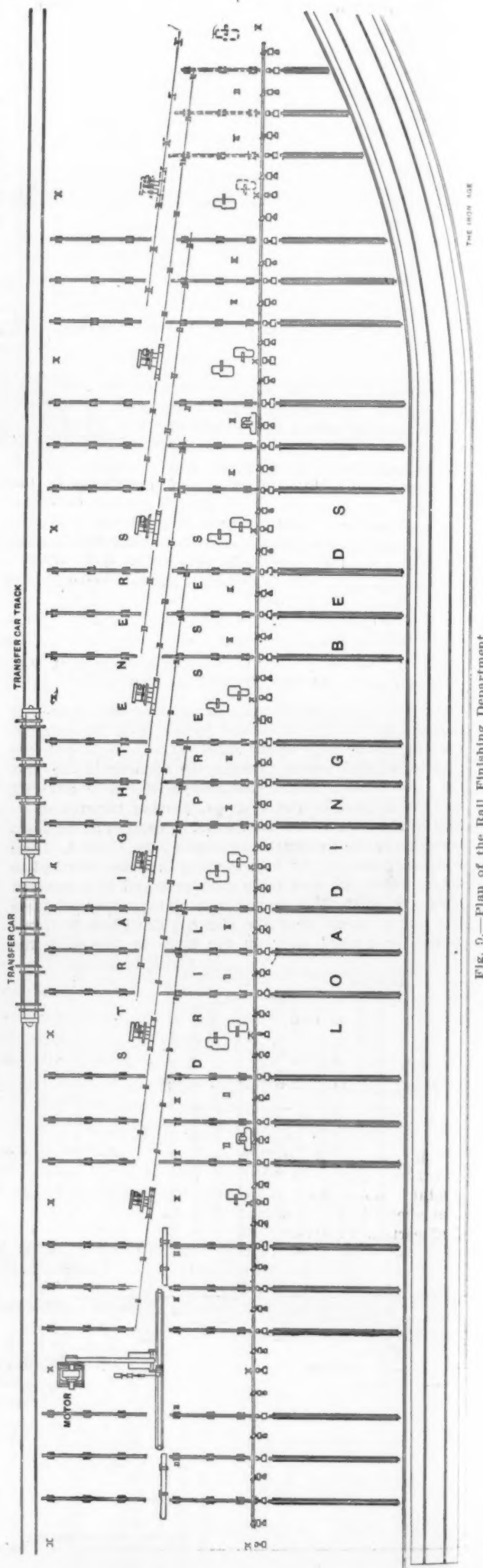


Fig. 9.—Plan of the Rail Finishing Department.

An interesting fact in connection with this mill is that construction was authorized at the stockholders' meeting in October, 1904, and the first rails were rolled on April 22, 1905. The engine driving the 28-inch mill was delivered in 87 days after placing the contract. Taking into consideration the fact that practically all foundations and machinery were put in place during the

pany formed for the purpose of exploiting in all countries the new machines for the application of this process. The

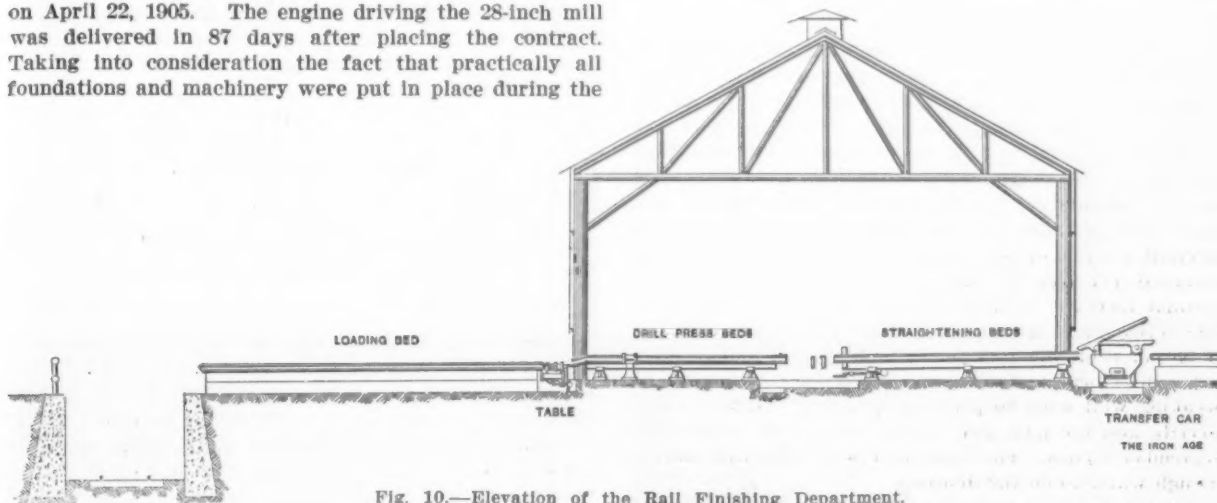


Fig. 10.—Elevation of the Rail Finishing Department.

winter months, this work was done in remarkably quick time.

The mill is capable of producing 1800 tons of rails in 24 hours, although at present the production is about half of this, the other half being rolled into billets in order to supply the company's various merchant mills in the Mahoning Valley.

The United Engineering & Foundry Company, Pittsburgh, Pa., designed and furnished the mills, tilting table, tables on delivery side of mill, hot and cold saws and rail hot beds. All other machinery was designed in the

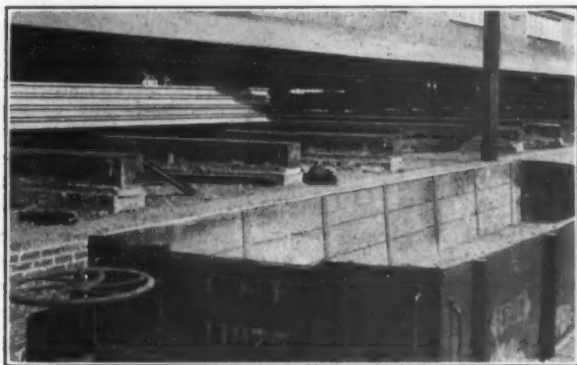


Fig. 11.—Loading Beds, Where Rails Are Loaded for Shipment.

Republic Company's engineering department under the direction of its engineer, H. Z. Bixler.

**The National Founders' Association.**—The National Founders' Association has published a handbook giving a complete list of its members up to October 1, 1905. The total is 457 firms and incorporated companies, but in a number of instances a single company, as in the case of certain well-known consolidations, represents several plants. The distribution of membership by districts is as follows: First district (New England States), 56; second district (New York and New Jersey), 93; third district (Pennsylvania, Delaware, Maryland and District of Columbia), 73; fourth district (Michigan, Ohio and Kentucky), 83; fifth district (Indiana, Illinois, Missouri, Kansas, Colorado, New Mexico, Utah, Arizona, Nevada and California), 70; sixth district (Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Montana, Wyoming, Idaho, Washington and Oregon), 37; seventh district (Canadian provinces of Ontario and Quebec), 20; eighth district (Southern States and Oklahoma), 25.

M. Emile Le Long, Brussels, Belgium, inventor and sole owner of the Le Long patented process for the manufacture of weldless chain, is at the head of a new com-

pany formed for the purpose of exploiting in all countries the new machines for the application of this process. The

### The Philadelphia Foundrymen's Association.

The one hundred and fifty-first regular meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, Wednesday evening, November 1. Thomas Devlin, president, occupied the chair. Unimportant routine business was transacted and the treasurer reported a balance of \$1951 on hand, all bills being paid. O. P. Briggs of Detroit, Mich., commissioner of the National Founders' Association, made a short address on the general labor situation in the foundry trades and outlined briefly the association's object and method of work.

The local labor situation is now one of particular interest, owing to the difficulties that a number of foundrymen are having in operating their plants. Some time since the core makers demanded an advance in wages. This having been generally refused by the employers the core makers struck and have since been supported by a sympathetic strike of the iron molders in some ten or twelve foundries. The proprietors of those foundries declare that they will operate their plants hereafter without union labor, or, in other words, conduct an open shop. After some discussion on the different phases of the situation a motion was passed conveying the sympathy and extending the moral support of the Philadelphia Foundrymen's Association to the various foundries affected by the strike.

The paper before the association at this meeting was on "The Effects of High and Low Blast Pressure in Cupola Practice," by Wm. H. Coleman, Chicago, Ill., and was read by A. D. Snyder of Philadelphia. Following the reading of the paper there was considerable discussion, largely technical and hypothetical, at the conclusion of which the meeting, after tendering a vote of thanks to both Mr. Coleman and Mr. Snyder, adjourned.

A project is on foot looking to the substitution of electricity for steam on the line running from Nice to points along the Italian frontier. The fact that there are a number of tunnels along the route is a special feature in the determination. There are several large hydraulic plants in the region, and opportunities exist for installing others, so that the electric power could be readily obtained. There is some difference of opinion as to the form of traction to be used, some engineers favoring electric locomotives hauling trains of the usual type, while others advocate the use of lighter cars, or trains of motor cars and trailers, and a more frequent service. Of course a large element in the project is that of the cost of the change and of the relative costs of installation and operation of the various schemes proposed.

## Unwatering the Hamilton Iron Mine.\*

BY JOHN T. JONES.

In September, 1891, the Hamilton mine at Iron Mountain, Mich., was sinking its No. 2 shaft on what I call a "stunt contract." The men were working under a verbal contract, which lasted during the entire sinking of the shaft, as follows: They were paid company account \$2.25 per day up to 50 feet per month. On all speed made over 50 feet they received a bonus of \$1 per foot for each man. For the month of September each of the 30 men received a bonus of \$67, which means that they sank and timbered 117 feet for that month. There had been a gradual increase from 50 feet at the start to 117 feet. The entire shaft is dolomite of the chemical composition of 65 per cent. lime, 30 per cent. magnesia and about 3 per cent. silica, and was very hard on steel, although breaking well with 45 per cent. powder. All was going merrily and the men were in expectation of beating the September month. The shaft had been sunk with barely enough water to do the drilling.

On October 22 I noticed a commotion at the collar of No. 2 shaft. The men had brought to the surface a miner named Biddick, who was just finishing the last hole in the series in the northwest corner of the shaft. Four cross bars were lowered at the same time with two drills on each bar, and as soon as the drills had finished their holes the bars were hoisted to the surface. All had been hoisted but Biddick, when he struck into a vugg. The water came out with such force that Biddick was tossed like a ball and was brought to the surface blinded and nearly dead. Captain Carbis and myself got on the bucket and gave orders to the engineer to hoist to the surface at the first stroke of our bell and went down. All that could be seen was a waterspout boiling through the mass of water. The drill and cross bar are still in the bottom of the shaft, 1448 feet deep.

The plan of drilling adopted for cutting down showed 24 holes, the eight end holes perpendicular, those in the next row at a slight angle, the center cut eight holes about 60 degrees. All in the series were drilled, then all were plugged with turned plugs, except the eight center cut holes. These were first blasted and mucked out, then the angle holes were blasted and mucked and last the end holes.

### Ludington Water Goes to Hamilton.

Toward evening Mr. Banks, the superintendent of the Ludington mine, came to my office and said he was much obliged to me for taking the water from the sump at "A" Ludington, the water going to my new No. 2 Hamilton. This sump was several hundred feet above where we cut the water in No. 2. The water continued to rise in No. 2 until it came within 90 feet of the collar of the shaft. We were then installing the 10-ton hoisting plant and decided to experiment with bailing to see if the water would abate. We were working at this plant when, on December 31, the hanging wall of the Ludington began to move and the water came into the eleventh level of that mine. The water was measured and was running at the rate of 6000 gallons per minute. This drowned out the Ludington and filled the No. 1 Hamilton. The Ludington made futile attempts to get the water down until February 6, 1892, when the management pulled the pumps and abandoned the mine. The water then rose until it reached the water level in No. 2 Hamilton, 90 feet from surface.

At this period negotiations were pending to have the Hamilton and Ludington take care of the water jointly. The managements not being able to agree on any proposition, P. L. Kimberly bought a controlling interest in the Ludington, the minority agreeing to form an unwatering pool and divide the expense pro rata between the two companies, according to the holdings of the stockholders. It was the opinion of most of the stockholders that the water came from a vugg, or cavern, and after

emptying would abate and resume the normal flow. All were of the opinion that if the flow of 6000 gallons was constant the properties would be valueless.

By June, 1892, the five shafts were equipped with bailers of a total capacity of 8000 gallons per minute. Before starting we had to connect the 1325-foot level of the No. 1 Hamilton, which was still dry, with the No. 2 on account of the latter having a bailing capacity of 2560 gallons in each of its two large bailers, or 10 gross tons per trip, and two other bailers with a capacity of 500 gallons each. On April 1, 1892, we had made a test of the bailers in No. 2 and found that we could keep the water down by running about one-fourth of the time. We then closed down until we finished negotiating.

### Dangerous Work of Connecting the Two Shafts.

We had made the opening to connect with the 1325-foot level at No. 2 and had started a cross cut from No. 1 toward No. 2, leaving a distance of 275 feet to connect the two shafts. This connection would have to be made through No. 2 and the question arose, what would be the danger to human life when it came time to put in the final shot that would bring the water? It was decided to drill advance holes, one center hole and four angle holes 28 feet long. Mine surveying has been reduced to a science, but when life is at stake it takes great faith to place men in a dangerous position. So we were compelled to take additional precautions in these holes. We started these feelers when within 50 feet of the breast in No. 2 cross cut. The pressure of water at this depth is practically 600 pounds to the square inch, or 43 tons per square foot, or a total of 6000 tons against the face of the drift. When within 50 feet of the water the drift began to wrinkle, making a continuous shower of limestone flakes fall from the roof of the drift. This is the time it tried men, but Captain Carbis and his assistants never flinched. They kept working until one of the drills struck through.

The expectation was that water would come, but it was compressed air that had been driven ahead of the water on that drift when it came into the Ludington and had remained there under that pressure of 6000 tons. When the drill was released from the chuck it went out of the hole like a ramrod out of a gun, struck the side of the drift and bent like a bow. The remaining holes were then charged and fired. After the blast the captain let down a box with candles and found the barrier was still unmoved. He then recharged all the holes, tamped them and fired again. This time the water came up the shaft faster than a man could climb, and the undertaking was accomplished without the loss of a life.

The bailers were then put in operation and in 21 days we had lowered the water 896 feet, hoisting 54,000,000 gallons with the large bailers at No. 2 Hamilton, 10,000,000 gallons with the small bailers at the same shaft, 4,000,000 gallons from the Ludington A shaft, 11,000,000 gallons from the Ludington B shaft, 600,000 gallons from Ludington No. 5, and pumping 4,000,000 gallons with a Cornish pump, making a total of 87,000,000 gallons in 21 days. The flow was then normal and in six weeks the water was out of both mines.

I would advise any one undertaking a like job to drill diamond drill holes at least 75 feet ahead and tap the water with enough holes to lower it.

**Helping American Exporters.**—The American Consul at Prague, Urbain J. Ledoux, has, on the pattern of a chamber of commerce, established a special bureau for the registration and examination of catalogues of all kinds. Those who send him their trade literature should observe that catalogues without prices or discount lists would be useless; moreover, the weights and measures should be reduced to the standards adopted in the country of their destination. Lists of references should also be added. Parties sending printed matter should at the same time advise regarding the various specialties they handle, so as to save tedious searching and to facilitate registration.

\* A paper read at the eleventh annual meeting of the Lake Superior Mining Institute, at Iron Mountain, Mich., October 17-19, 1905. Mr. Jones was manager of the mines mentioned in the paper.



### Temporary Plant for Building Steel Cars.

When the London Metropolitan Railway decided to convert its system to electric power it placed a contract for 100 steel cars with the American Car & Foundry Company. The conditions demanded the highest possible speed of construction, which required the best of tools, including a great number of pneumatic tools and most up to date manufacturing equipment. Since the contract covered only a short period, the plant installed was necessarily temporary in character, but every detail has been provided for in the machinery equipment which is necessary to economical output and reliable service.

The order for the complete pneumatic equipment was

### High Power Parsons Turbines.

BY FRANK C. PERKINS.

For the past two years the parallel flow steam turbine of the Parsons type has been constructed at the Victoria Works, Rugby, England, in connection with the well-known high speed vertical engines of Willans & Robinson, Limited. The accompanying illustration, Fig. 1, is a view in the erecting shop at this plant showing the turbine parts ready for assembling.

Fig. 2 gives a detail of the blading, showing the shrouding on the blades. Fig. 3 shows the shaft of a 5000-kw. turbine ready for blading, and Fig. 4 a 1000 horse-power



Fig. 1.—A View in the Erecting Shop at the Victoria Works of Willans & Robinson, Rugby, England.

placed with the Ingersoll-Sergeant Drill Company of New York and London, and the appliances furnished were of the company's standard types. The tool equipment proper included 18 8-inch and 25 5-inch Haeseler riveting hammers, and 16 No. 7 and 24 No. 12 Haeseler rotary drills—83 tools in all.

Power for these tools is furnished by four air compressors. They are of the builder's class "JC" duplex two-stage machines of balanced type, with a heavy inside fly wheel, solid subbase and semitangye frames. The air cylinders are completely water jacketed on heads and barrels, while an intercooler in the subbase beneath the cylinders provides interstage cooling at high efficiency. The Sergeant piston inlet air valve is applied on both cylinders, and the discharge valves are of vertical lift direct discharge pattern. At the rated speed of 150 revolutions per minute each compressor has a displacement of 526 cubic feet, giving a total free air capacity to the plant of 2104 cubic feet per minute, which is delivered at a pressure of 80 pounds. Each unit is belted to a direct current British Westinghouse motor rated at 110 horse-power at 550 revolutions per minute. Standard automatic choking controllers on the compressors maintain pressure and regulate the output as the load varies.

Willans-Parsons steam turbine opened up on special hinges designed for the purpose, which is a special feature of this design.

It is stated that the Willans-Parsons turbine is identical in principle and in its main features with the Parsons standard turbine, differing only in details of design and manufacture. These changes have been introduced only with a view to lending greater flexibility to the turbine when in use and facilitating manufacture on the interchangeable system, which is a special feature of the Willans-Robinson high speed reciprocating engine construction.

The arrangement of the governor gear, oil pump, steam pump and water piping has had special attention, as it has been found that ability to inspect the working parts of a turbine without dismantling is a great convenience. To enable this to be attained all the gearing and fittings named above are mounted on the bottom half of the bearing pedestals, and the top cover of the turbine as well as the bearing caps of the three main bearings are left free so that they can be easily removed.

To greatly facilitate opening up the turbine the top half of the casing has been arranged with two hinges, thus avoiding the use of guide studs and placing the tur-

bine cover in a suitable position for examination. In the 1000-kw. turbine it is possible for two men to remove the main bearing caps and to open up the turbine for inspection in less than an hour, as shown in illustration Fig. 4.

The balancing passages have been rearranged so as to somewhat shorten the length of the ordinary parallel flow turbine and, further, due to Fullagar's system of

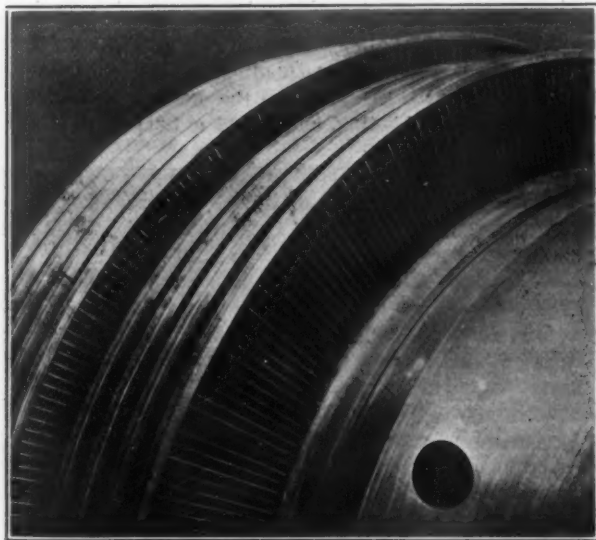


Fig. 2.—Detail of the Blading on the Rotor.

balancing, it has been found possible to dispense with the large balance piston at the high pressure end of the turbine and to substitute in its place one of smaller dimensions at the low pressure end. This method of arranging the balancing pistons has the advantage of enabling cast-

are built up on two-half rings which have had the necessary grooves for receiving the blades cut in them by means of automatic machinery. These complete half rings of blades are then caulked into the shaft or the casing. The cutting and assembling of the blading by means of specially designed automatic machinery insures that the blade and openings on which the efficiency depends are mathematically correct.

H. F. Fullagar has designed another feature of the Willans-Parsons turbine which consists in the special channel shrouding encircling the blades. This shrouding is fixed on the half ring of blades before assembling on the shaft or in the casing and has several points of merit. It adds materially to the mechanical strength of the blades themselves and removes danger of the blades stripping should the rotor come into contact with the casing or the blading on the casing come into contact with the revolving shaft. The action of the channel shrouding when under working conditions minimizes the loss due to leakage over the revolving or fixed rows of blades and by this means considerable gain in steam economy is effected.

The governor gear has been carefully redesigned with a view of making it as simple and as reliable as possible. By dispensing with some of the intermediate gears hitherto used on governors controlling steam turbines it has been found possible to eliminate many of the undesirable features and to obtain results in the direction of close governing which it is believed surpass anything hitherto obtainable. All the turbines are fitted with by-pass valves which automatically open when the maximum economical output of the turbine is exceeded, and by means of them any required overload can be obtained within the full ability of the generator, the steam economy of the turbine being of course reduced.

It is stated that turbines of this construction of 24,250 kw. are at work or nearing completion. The smallest at the present time are of 750 kw. normal capacity and the

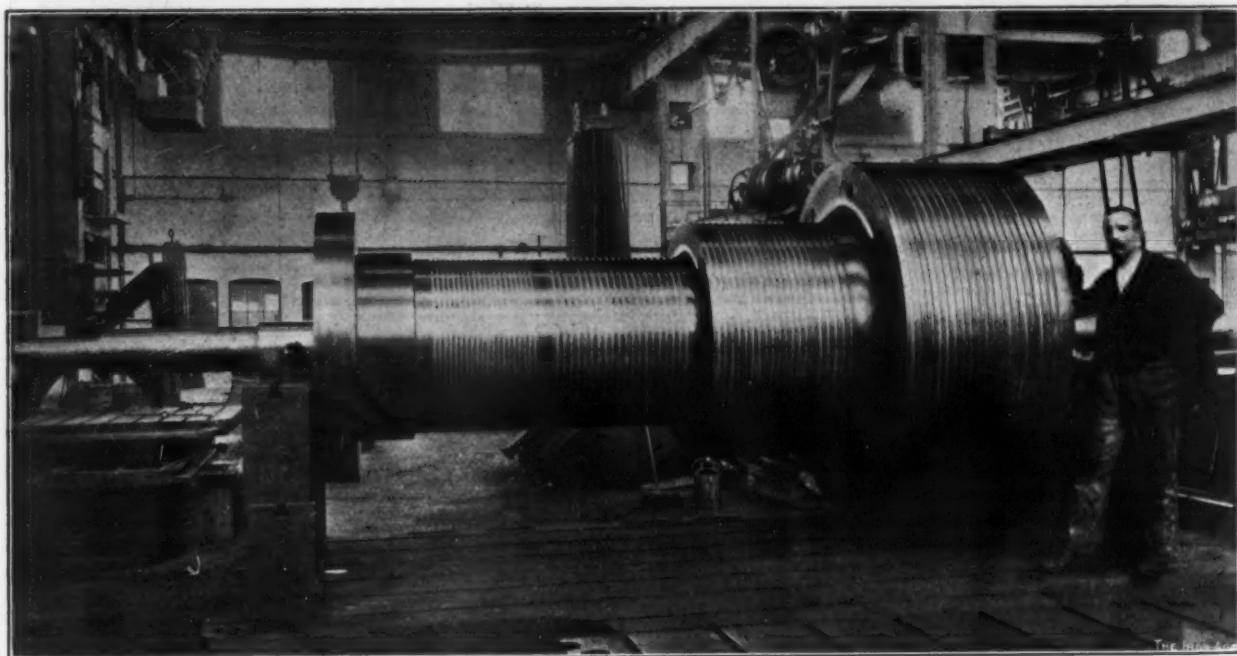


Fig. 3.—The Shaft of a 5000-kw. Turbine Before the Blades Are Put On.

ings of a more symmetrical form to be adopted, and in this way many of the troubles brought about by unequal expansion of the different parts are avoided.

What is considered a greatly improved method of attaching the blades to the rotor and casing has been adopted, and extraordinary stiffness and rigidity are given to the blade rings when they have been fitted into their respective body or shaft grooves. In the ordinary turbine of this type each blade is fixed separately into the rotor and casing by means of its own caulking piece. As will be noted in Figs. 2 and 3, the blades for one complete ring

largest of 5000 kw. normal capacity. Two 3000-kw. turbines and one 1500-kw. turbine have been installed for the Glasgow corporation and two 1000-kw. units for the Bristol corporation. A 3000-kw. turbine is in operation at the plant of the Metropolitan E. S. Company, London, and two 1000-kw. units were installed by Bruce, Peebles & Co., Limited. Other recent plants using Willans-Parsons turbines include Watson's of Linwood, having a 1000-kw. unit, and the English McKenna Steel Process Company, Limited, at Birkenhead, having 3 units of 750 horsepower each.

### Test of the New Foster Reducing Valves.

A demonstration of the new reducing valves made by the Foster Engineering Company, Newark, N. J., was given last week at the works under the supervision of H. C. Foster, vice-president and treasurer, before a number of representatives of the navy, the engineering profession, the trade in general and the technical press. Among those present were Admiral J. A. B. Smith, Commanders W. C. Eaton and Albert Moritz, Lieut. W. B. Day, Ensigns William Morris and A. S. Kibbee; B. McL. Long, Arthur E. Foster, O. R. Young and Lewis T. La Naire, consulting engineers; Chas. E. Delancy, agent for Harlan & Hollingsworth; J. M. Farris, master mechanic Youngstown Iron, Sheet & Tube Company; E. Maxwell Brigam, sales manager, Manning, Maxwell & Moore, and S. S. Stewart, Pittsburgh representative of the Foster Engineering Company.

The first test was upon the new type G reducing valve, to show that steam may be delivered at a constant pressure regardless of variation in the volume of the discharge or increase or decrease of initial pressure; that the valve would operate equally well in horizontal vertical, inverted or inclined positions, and that it would

the speed of the pump. A variable volume of discharge was obtained by connecting the manifold to the discharge of the pump. The pump was speeded up to its maximum and the discharge was maintained at the predetermined pressure, 100 pounds.

The third test was upon the class Y reducing valve for high initial pressures—1400 pounds and up—and low delivery pressure—140 pounds—as used for expelling gases from guns after discharge. An 8-inch iron pipe 20 feet long was used to illustrate the effect of air admitted to the inlet of the pipe. Oily waste was placed in the tube and ignited to fill it with smoke. A quick opening gate valve was placed on the line to the tube from the outlet of the reducing valve and opened suddenly to expel the gas. The reducing valve maintained the delivery pressure as required and the result was entirely satisfactory.

A combination valve applied to a boiler for closing down in case of a rupture in steam main was next tested. A quick opening gate valve was placed in the line and opened to the atmosphere, which gave the same practical result as a break in the main. In this operation the automatic valve on the boiler closed instantly and shut off steam to the line. The main valve was then

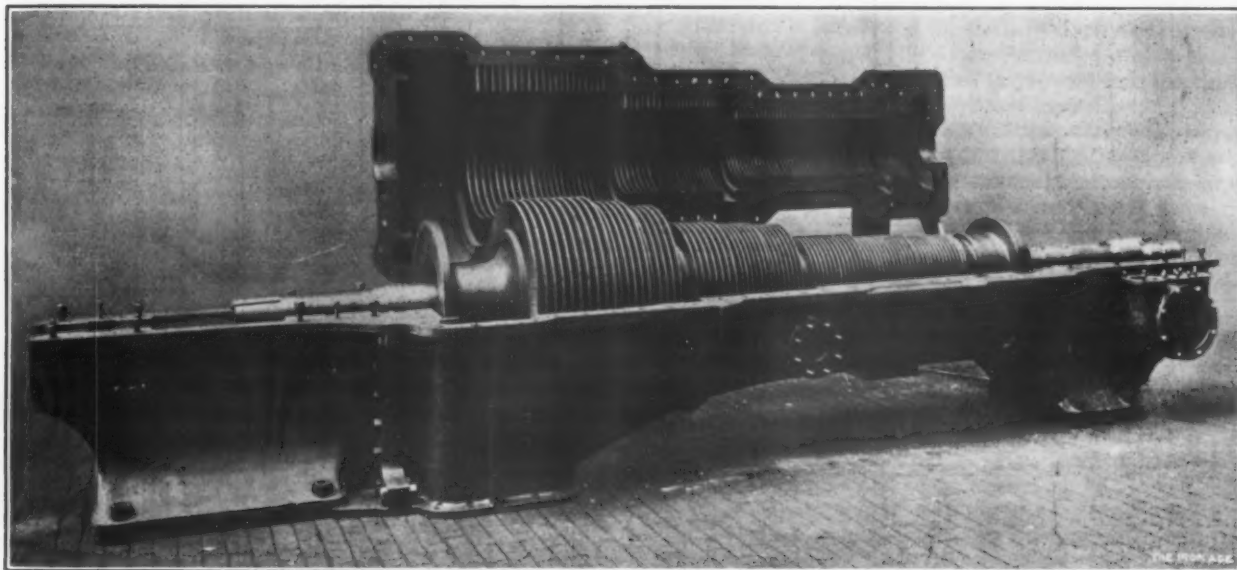


Fig. 4.—A 1000 Horse-Power Willans-Parsons Turbine with the Casing Opened.

close off tight when no steam was being delivered. The valve was first placed on a horizontal pipe in a vertical position. Steam was turned on at an initial pressure of 250 pounds and the valve set to deliver 30 pounds. A variable volume of discharge was obtained by opening and closing at intervals four  $\frac{1}{2}$ -inch outlets connected in manifold to the discharge pipe, the steam first passing through a small receiving tank. During this test the delivery pressure did not vary 1 pound. The receiver was then taken off and a  $1\frac{1}{4}$ -inch quick opening gate valve was placed on the line direct from the outlet of the regulator. This was frequently opened and closed without showing variation of delivery pressure exceeding 2 pounds. The valve was then inclined at different angles and inverted, the results obtained being the same as when upright. The initial pressure was then lowered and the delivery, with variable volume of discharge, remained constant until the initial pressure had fallen to 33 pounds. The diaphragm was then removed while steam was passing through the valve, delivery pressure being 60 pounds and 30 pounds, with the initial at 250 pounds. The operation of removing the diaphragm required less than five minutes. It was then suggested that all tension be removed from the spring to see whether the valve would hold tight while delivering no steam. This was done and the gauge showed no pressure.

In the second test a piston actuated pump governor was tested to illustrate the maintaining of pressure by

closed by opening a small valve in the emergency line to illustrate emergency closing with the same satisfactory result.

The fifth test was to illustrate the automatic safety stop valve to be used in connection with steam lines whereby the rupture of one line will close the valve and shut off steam from that particular line without shutting down the whole plant. The same quick opening gate valve as in the combination valve test was used, with the result that the automatic safety stop valve instantly closed down.

After the tests the guests were entertained at the Union Club, Newark.

By an electrolytic process similar to that now so successfully used in the reduction of aluminum ores the metal calcium, which has undergone a long period of experimentation, is now being produced in commercial quantities. In the process as carried out in Germany the molten metal is formed at the cathode terminal of an electrolytic chamber. There is a large demand for the metal in connection with the hardening of steel and it is thought that it will serve many useful purposes. The price of the metal has been reduced from \$280 per ounce in 1903 to a present value of 37 cents, or less than one-seventh of 1 per cent. of the former figure, and indications point to a still further reduction in the near future. This great saving in cost is attributed to the success of the new process of production.



### Technical Publicity Association.

At a meeting and banquet of the Technical Publicity Association, held at the Aldine Club, New York, Friday evening, November 3, the following officers were elected: President, C. B. Morse, Ingersoll-Rand Drill Company; first vice-president, H. M. Cleaver, Niles-Bement-Pond Company; second vice-president, Frank H. Gale, General Electric Company; secretary, Rodman Gilder, Crocker-Wheeler Company; treasurer, H. M. Davis, Sprague Electric Company; members of Executive Committee, Graham Smith, Westinghouse Companies, and Charles M. Manfred, H. W. Johns-Manville Company.

H. M. Davis addressed the association on "The Advertising Appropriation." An informal discussion followed, in which the members exchanged views on the disposition of advertising appropriations, the relative amount that should be spent in magazine and circular

### The Hughes Automatic Smoke Preventer.

An ingenious means of preventing the discharge of black smoke from a boiler furnace during firing has been invented and patented by H. H. Hughes, 1308A Kentucky avenue, St. Louis, Mo. The purpose of the device is to admit heated air into the fire box above the fuel at a time when a surplus of oxygen is required to consume the gases and volatile matter that are generated when green fuel is put on and to gradually reduce the supply of oxygen as the fuel becomes incandescent. The same results of course can be obtained with a valve controlled by the fireman, but to eliminate the element of neglect and carelessness this device makes the action automatic, at the same time relieving the fireman of care.

As will be seen by the illustrations the device consists of a dead plate, with openings between and at the sides of the wall liners and a series of dampers attached

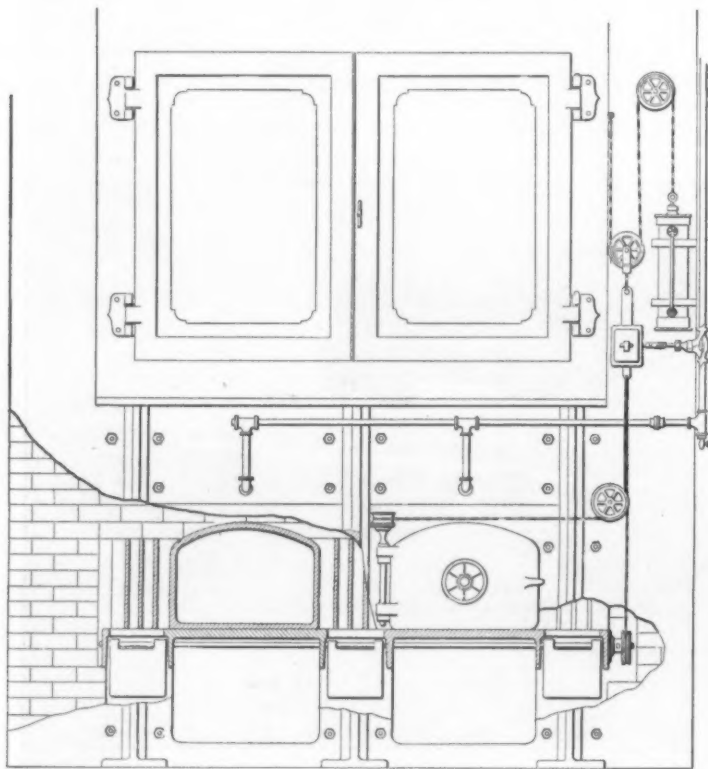


Fig. 1.—The Hughes Automatic Smoke Preventer Applied to a Furnace.

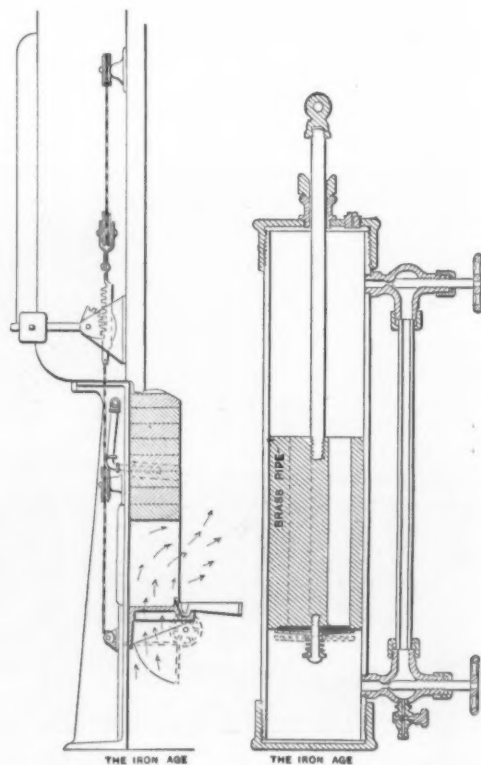


Fig. 2.—Detail of the Dash Pot.

advertising, the relation between the advertising appropriation and the volume of business, &c.

One of the difficulties with which motor boats operating in rough water have to contend is connected with the fact that no means have been provided to protect the magnetos, which furnish the sparking current, from the action of the water. As soon as water strikes the magneto a short circuit ensues and the device is rendered useless; the engine then stops, due to a failure to obtain the necessary spark; the boat, having no steering way, is liable to turn broadside on to the sea, and its occupants are in great danger. Common sense would seem to dictate the inclosure of the magneto as a method of ordinary precaution.

On the Sihl River, in the canton of Schwytz, Switzerland, is to be erected a dam 90 feet high and 350 feet long, for the purpose of impounding water in a lake as a storage reservoir for the use of an electro-hydraulic plant on the shore of Lake Zurich. The area of the lake will be 2 square miles, and its cubic capacity about 96,000,000 cubic meters (25,360,000,000 gallons). The head of water obtained will be 480 meters (1575 feet). It is estimated that the plant will have a continuous capacity of 20,000 horse-power, or a capacity during ten hours per day of 45,000 horse-power, which will be ample for all present needs in the vicinity.

to a rod to close these openings automatically and gradually. A small drum is attached to the hinge rod of the fire door, around which a chain is passed, as shown in Fig. 1. The act of opening the fire door winds the chain on the drum, which raises the damper balance, opens the dampers controlling the openings in the dead plate and raises the piston in the dash pot. If steam jets are used for increasing the draft an arrangement is made for opening the valve in the steam pipe. When the draft is good and the firing is done in the proper manner no steam is required.

After firing, when the fire door is closed, the piston of the dash pot gradually assumes its normal position, slowly closing the openings. The time required for closing the dampers, from one and a half to three minutes, is regulated by the by-pass valves on the dash pot, Fig. 2, which can be set for any desired time, according to the character of the fuel used. For instance, where slack or fine soft coal full of volatile matter is used the dash pot is so arranged that a longer period of time is required to close the dampers than where a clean screened coal is used. Small turnbuckles inserted in the chains make it possible to adjust the movements of the parts to a nicety.

A detail of the dead plate is given in Fig. 3, showing an opening and its controlling damper. Just over the openings, as may be seen in Fig. 1, are placed vertical plates of cast iron, the object of which is to superheat the

air. When the dampers are closed these plates absorb heat from the furnace and when the dampers are opened tend to raise the temperature of the air before it enters the furnace and improve the efficiency of combustion. The plates do not burn out because they are cooled off so frequently. Where the wall liners are close together they serve the purpose of the plates and the latter may be omitted.

If at any time after the device is installed it is desired to operate the boiler without using it, all that is necessary is to remove the chain from the drum at the door hinge. The device can be applied to any boiler at small cost in about ten hours.

The inventor, Mr. Hughes, is the superintendent of the Koken Iron Works, St. Louis, Mo., but is undertaking

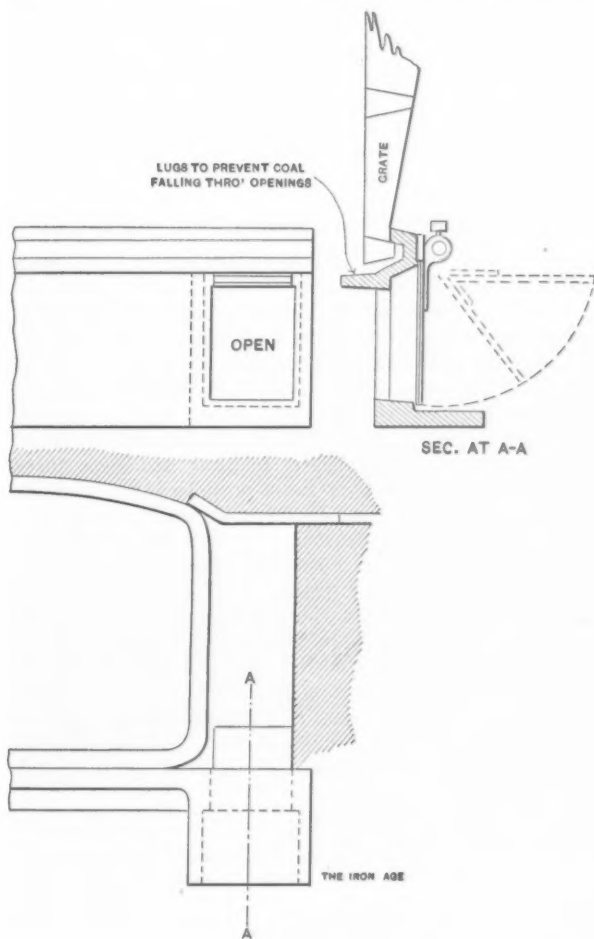


Fig. 3.—Detail of the Dead Plate.

the sale of his smoke preventer independently of that firm. At the St. Louis World's Fair the device was tested by Professor Randall of the Illinois State University, during the boiler tests made for the Geological Survey, at the fuel testing plant and was awarded a gold medal. Many of these smoke preventers have already been installed in prominent plants and are stated to be proving very satisfactory.

Shear legs recently erected in the Chatham dock yard (England) are believed to be the largest in existence. They have been tested up to a load of 180 tons at the maximum overhang of 64 feet. The front legs are 160 feet high, 5 feet in diameter in the center and weigh 44 tons each. The back leg is 210 feet long, 6 feet in maximum diameter and weighs 53 tons. It is operated by a screw 85 feet long and 11½ inches in diameter, which weighs 11.3 tons and is actuated by a set of steam engines. There are three hoisting winches, each with its separate engine. Two of these winches have a capacity each of 90 tons and these were used in the maximum test, when a speed with full load of 10 feet per minute was easily obtained.

## Experimental Desulphurization.

BY REGINALD MEEKS.

Sulphur causes more trouble and injury to iron castings when in excess than any other impurity, and yet the percentage of sulphur is lower than any of the other metalloids. It would seem to be a comparatively easy matter to remove a large portion of this injurious element, since it exists in such a small amount, but attempts in this direction have met with the most stubborn resistance.

### Limestone Proves Useless.

Some years ago the writer was connected with a large car wheel foundry and assisted in several attempts to reduce the percentage of sulphur in the product. At the time the H. C. Frick Company withdrew from the merchant trade, the other coke manufacturers were pushed to their utmost to supply the demand, and hence the quality of coke was very materially impaired. The sulphur in the fuel frequently ran higher than 1.5 per cent., and consequently the castings were abnormally high in this impurity. Our castings were no exceptions to this state of affairs, and it was decided to try to remedy this evil by the generous use of limestone. The cupola was a large one, having a 90-inch shell lined to about 68 inches, and the charge consisted of 425 pounds of coke to 4400 pounds of iron, introduced into the cupola in double charges of both coke and iron.

At first 100 pounds of crushed limestone was charged on top of each coke charge, but this had no appreciable effect on the sulphur in the iron. The stone was gradually increased until 400 pounds were being used per charge. The test bars previous to the experiment analyzed 0.210 to 0.220 per cent. in sulphur, and during the test the analysis showed from 0.208 to 0.212 per cent., or about 0.005 per cent. decrease. Even this infinitesimal amount of decrease could have been due to other causes.

On the other hand, the effect of the increase of limestone upon the lining of the cupola was disastrous. All through the trial the flame showed considerable cutting and toward the last the shell became red hot over several thin places in the lining. The latter was so badly eaten that repairs had to be made long before the regular time. Limestone as a flux and a corrective is excellent, but as a desulphurizer is of no use, so far as the writer's experience has gone.

### Experiments with Manganese Ore.

The high sulphur conditions remaining in diabolical control, another attempt to solve the problem was decided upon. From time to time articles have appeared mentioning the successful use of manganese ore in German cupola practice. So a carload of ore was bought which analyzed about 40 per cent. manganese. Here was just the thing. Sulphur would combine with manganese, forming sulphide of manganese, which would naturally go off in the slag, according to some such reaction as follows:  $\text{MnO}_2 + \text{FeS} + \text{C} = \text{MnS} + \text{Fe} + \text{CO}_2$ . All was clear sailing till we tried the ore. Then we found that, as in the case of limestone, the results were of no value, and, moreover, were positively injurious.

As before, we started slowly, adding the ore to but ten single or five double charges. The additions were made directly on the coke, and while the experiment was on no limestone was added.

Test bar No. 7 was taken during the trial, while bars 2 to 6, inclusive, and 8 to 10, inclusive, represent the heat before and after the test. Borings from Nos. 2 to 6 and 8 to 11 were mixed and analyzed, and also those from No. 7, with the following results:

Elements.	Bars 2 to 6 and 8 to 11.		Bar 7.
	Per cent.		Per cent.
Silicon .....	0.63		0.61
Manganese .....	0.50		0.43
Combined carbon .....	0.83		0.99
Graphitic carbon .....	2.85		2.65
Phosphorus .....	0.357		0.362
Sulphur .....	0.216		0.217

It will be observed that No. 7 shows several interesting observations—namely, there was a decided loss in

manganese, the silicon remained practically unchanged, combined carbon increased 0.16 per cent., graphitic carbon decreased 0.20 per cent., the total carbon was practically unchanged, phosphorus showed no change, sulphur showed no change.

The slag was analyzed for sulphur, samples being taken at three parts of the heat. Before the ore was used sulphur showed 0.320 per cent.; while the ore was used sulphur showed 0.200 per cent.; after the ore was used sulphur showed 0.290 per cent.

Although the manganese in the iron was lower during the experiment than at other times, still it carried no sulphur with it, as is shown by the analysis of the slag. The color of the latter became very dark during the additions, due to high basicity, but lighter after the ore was stopped. However, the value of this material could not be determined by such a limited trial, so it was decided to conduct the experiment on a larger scale a few days later.

To make clear that which comes hereafter, it should be explained that a tap consisted of enough iron to pour 12 to 18 wheels, and each tap was lettered A, B, C, &c., down to Z, after which double letters were used. Also it should be understood that car wheels are measured on the circumference, about half way between the rim and the base of the flange.

A wheel whose diameter is exactly 33 inches is called a "tape 3," and for each  $\frac{1}{8}$  inch more or less the size becomes tape 4 or tape 2, &c. A tape 1 wheel, therefore, has a circumference  $\frac{1}{4}$  inch smaller than a tape 3, and a tape 6 is  $\frac{3}{8}$  inch larger.

The experiment was carried on with care and under uniform conditions, the details of which follow:

The ore was added for 30 single charges, beginning with the coke charge preceding the twentieth iron charge. Directly on the coke were charged 100 pounds of ore and 200 pounds of limestone. Then came the iron charge, then coke, &c. The latter consisted of 925 pounds of a (double charge) mixture of two-thirds Stonega and one-third Gauley Mountain, and on the eighteenth, twentieth, thirtieth, thirty-eighth and forty-sixth charges 100 pounds extra of coke were used. As soon as the ore had descended to the melting zone its presence began to be felt. Test pieces, or chilled blocks, showed a higher chill than normal, and at tap K the chill was so high that additions of 10 per cent. ferrosilicon had to be made to the iron in the reservoir ladle at each tap throughout the remainder of the heat. The amounts were as follows: K and L, 30 pounds; N, 40 pounds; O, 40 pounds; P, 30 pounds; Q, 45 pounds; R, 40 pounds; S, 50 pounds; T and U, 45 pounds; V, 40 pounds; W and X, 45 pounds; Y, 50 pounds; Z, 35 pounds; AA, 40 pounds.

In all 530 pounds of ferrosilicon were used in the reservoir ladle, and from 2 to 4 pounds of 80 per cent. ferromanganese extra were used on each charge as it went into the cupola during the experiment. Test bars Nos. 5 to 9, inclusive, were taken while the manganese ore was being charged. Bars Nos. 2 to 4 represent the period before, and Nos. 10 and 11 after, the additions. Analyses were made from a mixture of bars Nos. 2 to 4 and 10 and 11, each inclusive, bars 5 to 9 and a mixture of bars 2 to 11, inclusive. The record of these analyses is shown below:

Elements.	Bars 2 to 4 and 10 and 11.	Bars 5 to 9.	Bars 2 to 11	Slag.
	Per cent.	Per cent.	Per cent.	Per cent.
Silicon .....	0.63	0.55	0.60	....
Manganese .....	0.55	0.62	0.57	....
Combined carbon .....	0.76	0.83	0.80	....
Graphite carbon .....	2.86	2.79	2.66-2.70	....
Phosphorus .....	0.347	0.356	0.352	....
Sulphur .....	0.226	0.206	0.220	0.320

It will be seen that bars Nos. 5 to 9 showed a loss of 0.08 per cent. of silicon, notwithstanding the continued additions of 10 per cent. ferrosilicon. Hence the oxidation must have been very great. The manganese, however, was higher by 0.07 per cent., due to the addition of from 2 to 4 pounds of 80 per cent. ferromanganese on these charges. An equal exchange of combined for graphitic carbon took place, which was to be expected when the loss of silicon is remembered. Phosphorus remained practically unchanged, since the average of the first and

second column equaled the phosphorus in the entire mixture.

Sulphur was decreased 0.02 per cent., which is practically *nil* so far as desulphurization is concerned, and might have been caused by a better quality of coke, scrap or old wheels, &c., during that part of the heat.

The wheels from taps V to Z, inclusive, were under weight, and there were 13 tape 1 wheels, and the balance from these taps were tape 2. The wheels poured from the taps preceding and following experiment taped 3 and 4.

The breaking strength varied from 10 to 22 blows at 12 feet with the 140-pound weight. One wheel only broke at five blows. Twenty-four wheels were scrapped from taps V, W, X and Y, mostly on account of chill depth. In some cases the chill measured 17-16 inch, and the minimum was 15-16 inch.

The condition of the cupola was very bad after the test. The lining was much eaten and scaffolded and was very difficult to pick out the next morning. Of limestone 1850 pounds were used. The blast pressure used varied from 14½ ounces to 15½ ounces. After this trial all attempts to remove sulphur were abandoned.

#### Positive Methods to Obtain Low Sulphur.

The writer believes that there are only two positive methods to obtain low sulphur in iron castings—namely: 1. Use low sulphur materials throughout. 2. Use ferromanganese in the ladles or in the cupola. That sulphur will combine with manganese when the latter is in the form of ferromanganese and go off in the slag has been conclusively demonstrated many times.

It may prove of interest to give a few figures taken from the record of one heat: Sulphur had been about 0.220 per cent. in the bars for a considerable period, as was stated above. On one occasion oxidation occurred to a very dangerous degree, the test chill blocks showing clear white throughout. Ferromanganese was thrown into the reservoir ladle in great quantities. There was a large loss of wheels, but the sulphur was certainly removed, as is shown by the following analyses of a bar from tap U and two wheels, one from tap S and the other from tap V. Of course, the manganese is entirely too high, but it was necessary to work fast in order to save the heat. The manganese and sulphur in both wheels and bar are shown. The result was as follows:

	Tap.	Tape.	(Blow to) crack break.	Chill. Inch.	Manga- nese. Per cent.	Sulphur. Per cent.
Wheel .....	S	1	6 17	26-16	1.13	.167
Wheel .....	V	1	{ Tread broken, Plate not broken. }	28-16	1.42	.115
Bar .....	U	..	..	....	1.21	.136

The manganese in the bars ran from 0.50 to 0.55 per cent., and the sulphur from 0.220 to 0.230 per cent.; hence it will be seen that the sulphur was reduced from 0.220 to 0.115 per cent. by the addition of from 0.65 to 0.70 per cent. of manganese, or nearly 50 per cent. was eliminated. However, this was an extraordinary case and might never occur again.

In conclusion, the writer would like to suggest the publication of data relative to this very important subject, even if the experiments, like the above, should have a negative value.

A device to control the action of a fuse when subjected to an overload consists of a wire through which the current passes, and the expansion of which when heated allows it to be drawn aside by a spring. This side motion closes two contacts successively, the first of which sends the current through a heating coil, the effect of which is to melt the fuse in about five minutes. This operates when the overload is small. When the load is excessive the great expansion of the hot wire closes the second contact, cutting out the resistance in the heating coil and melting the fuse in 30 or 40 seconds. When the fuse melts the circuit is opened and the hot wire cooling cuts out the heating circuit. The device may be applied to both direct and alternating currents.



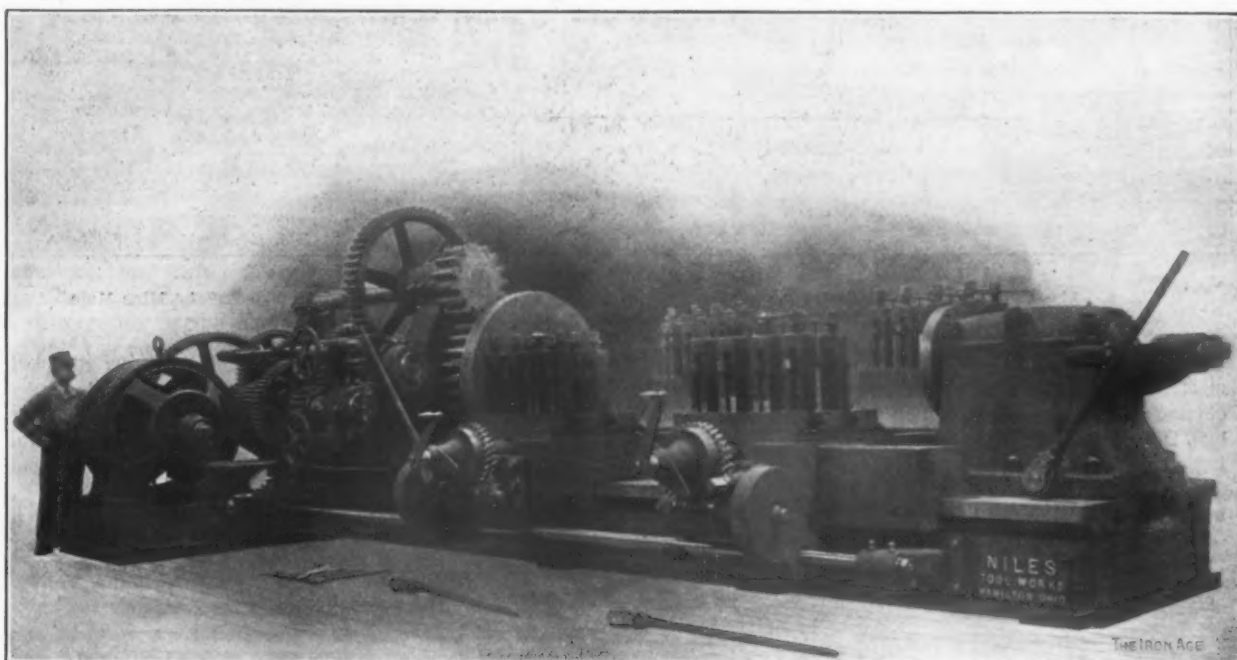
### The Niles Heavy Ingot Slicing Lathe.

The lathe illustrated herewith is especially designed for slicing ingots into blanks from which to roll steel tires or similar work. The tool was recently built for the Midvale Steel Company by the Niles Tool Works, Hamilton, Ohio, of the Niles-Bement-Pond Company. It swings 30 inches over the carriages, 48 inches over the shears and will take work 8 feet 6 inches long. The ingots to be sliced are held in chucks fitted to the face plates on the head and tail stock spindles and are not run on centers. In all its details the lathe is designed for heavy continuous service, and the driving and feeding mechanism has a factor of safety greatly in excess of the maximum required. A 50 horse-power motor provides the power, which is transmitted through a powerful train of gearing, providing variable speeds, to the head stock. The face plate is driven through a very heavy cast steel gear on its periphery.

The shears of the lathe bed have flat tops for the carriage bearings and are tied together with heavy course girts, closely placed. Openings are provided between the

within the period mentioned was 677,000 tons, in 1901, and the largest was 821,000 tons, in 1898. The proportion of steamships included in these losses is on the increase, due to the fact that steamships are rapidly increasing in numbers and tonnage, while sailing ships are undergoing a corresponding decline. During the first three years of the decade the tonnage of steamers lost, condemned and broken up amounted to 1,064,000 and sailing vessels 1,189,000. The figures for the last three years are 1,400,000 tons of steamers and 818,000 tons of sailing vessels. These figures offer an explanation of the fact that although some 1,800,000 tons of new ships are constructed each year the net increase is but slow.

**Lackawanna Rails for Australia.**—British trade papers have said that a contract was awarded some weeks ago to the Lackawanna Steel Company for 6282 tons of steel rails and 261 tons of fish plates by the Railway Commissioners of Victoria, Australia. It was said that English lines of steamers, owing to a shipping fight, were willing to accept a nominal freight from New York



Heavy Ingot Slicing Lathe Built by the Niles Tool Works.

shears through which the chips may fall. The bolt slots in the top of the bed have holes drilled in their bottoms through which water may drain into pits beneath the lathe.

The head spindle has very large long bearings and a deep flange to which the face plate is bolted. It is provided with an adjustable thrust bearing, the thrust washers of which run in oil pockets. The tail stock has hand traverse through rack and pinion. The tail stock spindle is fitted with a special face plate and revolves in its seat in the tail stock. A thrust bearing is also provided for the tail stock spindle.

The carriages are of massive design and carry both front and rear tool rests. Each tool rest has eight steel tool posts with screws for wide slicing tools. The two carriages have hand longitudinal movement by rack and pinion and the tool slides have hand and power cross feeds. The cross feed screws are of very large diameter and are driven by worm gearing. All hand and power feeds for the carriages and cross slides are independent, but a clutch is provided so that the feeds for all tool slides can be readily engaged and disengaged simultaneously if desired.

The annual "wastage" of ships, which has been nearly constant in quantity for the past ten years, amounted in 1904 to 738,000 tons. The smallest figure

to Australia, while exacting full rates from British ports to Australia. On behalf of the shipping lines it is denied that any rate has been named on the business in question, and it is stated that the Lackawanna Steel Company, in view of the fact that the contract means a full cargo, would be able advantageously to charter a steamer in the open market at the proper time, being thus independent of the shipping companies loading on the berth to Australia. The rails were sold at £5 13s. 6d., or \$27.60, ex-ship, at Williamstown, Victoria, and the fish plates at £8 9s. per ton, or about \$41.

With the construction of a new line between Brussels and Aix la Chapelle, designed for ultimate conversion into an electrically operated road, it is hoped to relieve the present congested state of traffic, both passenger and freight, between Belgium and Germany. The cost of construction and equipment is estimated at about \$10,600,000, and in order to provide for the future demands for speed no grades will be made of more than 1 per cent.; no curves will have a radius of more than 5 miles or of less than 1¼ miles, and there will be no grade level crossings or ordinary bifurcations. It is expected that at a time not far distant the conversion to electricity will be made, and a service calling for a speed of 200 km. (124 miles) per hour be inaugurated. The project has been placed before the Belgian Chamber of Deputies.

### A New Pit Car Loading Machine.\*

In mining coal by hand the miner lays prone on his side on the damp floor of the mine and digs a cut with picks under the coal across the face of the room. This cut is some 18 inches high at the face and slopes back to a depth of 4 feet from the face. The first attempt to do this same work by a machine resulted in the compressed air punching machine, which imitates the stroke of the miner's pick. This machine, greatly improved, has

to reduce the time required to load the coal. Fig. 2 shows a plan and side elevation of the machine. Its operation is as follows:

After the coal has been undercut by any of the various types of undercutting machines in common use at present it is shot down and this loading machine follows into the room. It is self propelled and is driven up to the edge of the coal pile at the end of the room track, the pony track is removed from under the sweep, allowing the nose end to rest on the floor. The other end of this

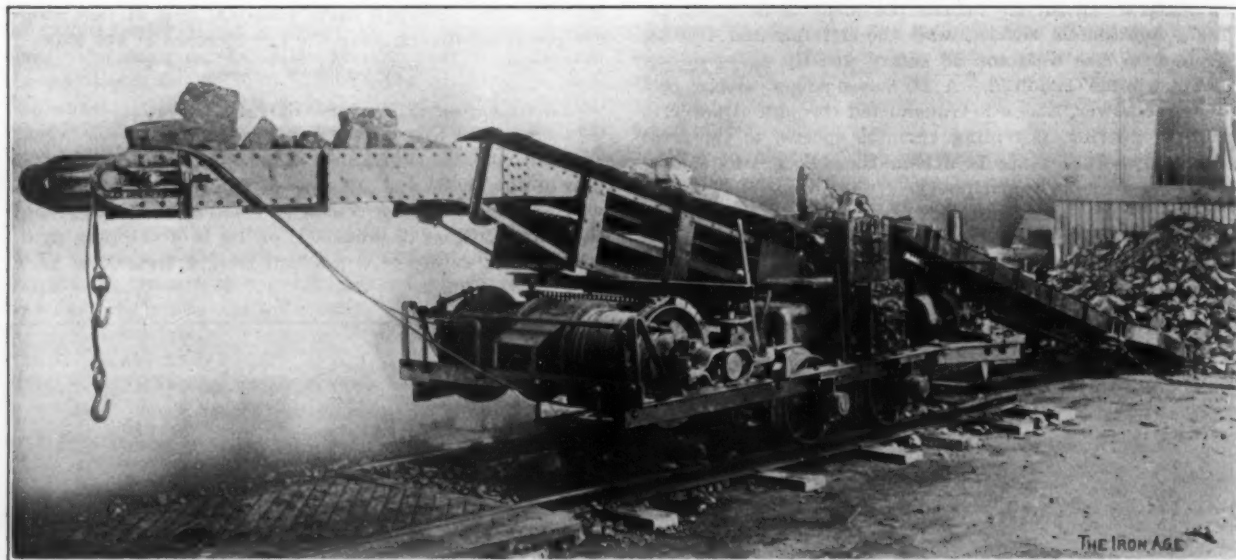


Fig. 1.—The Hamilton Pit Car Loading Machine for Loading Coal in Mines and Taking the Place of the Mine Mule.

many advantages and is in popular use to-day. The electric breast chain machine, which has the greatest cutting capacity has been principally developed in Columbus, Ohio, and has almost twice the capacity of the punching machine, but requires better conditions at the face. This chain machine makes the undercut, which was formerly made by the miner with his pick.

The undercutting of the coal was not the miner's hardest work. After the room is undercut, drilled and

sweep is supported by a universal joint driving sprocket. This universal joint allows the nose end and hinged gathering plate to conform to any unevenness of the floor. Power is supplied to the machine just as it is to a mining machine and the machine is ready for operation as soon as a car is placed.

When the sweep is started it moves from right to left, creeping under the edge of the coal pile, the nose of the sweep extending under the pile for a distance of 4

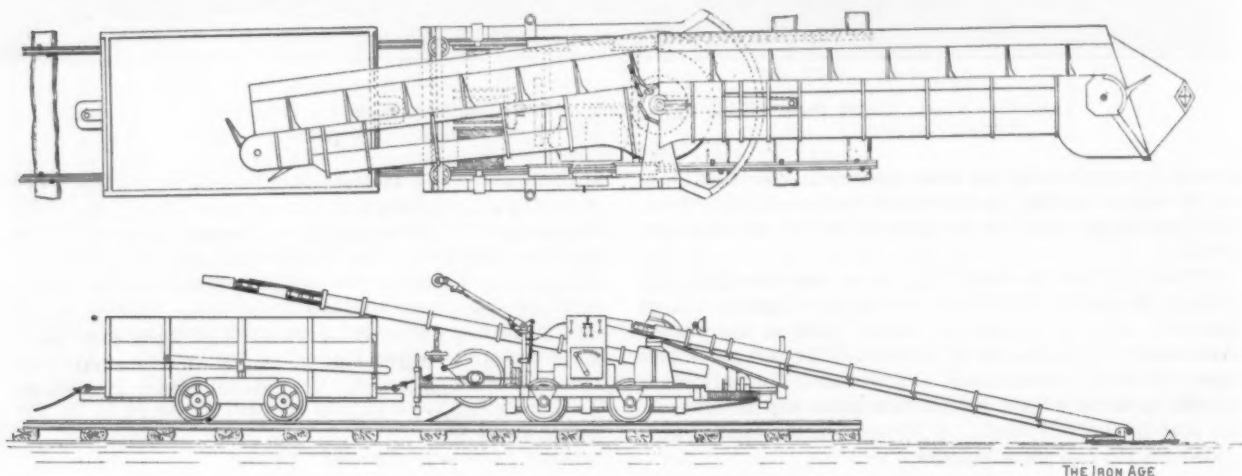


Fig. 2.—Top View and Elevation, Showing the Small Amount of Head Room Required.

the coal shot down, it must then be shoveled into the car, which is the most laborious part of all the work. Before the introduction of mining machines it required nearly one whole day for the miner to put in his undercut with a pick and about two days to shovel the coal out. This depended upon the hardness of the coal and thickness of the vein. The modern chain cutting machines will now undercut a room in an hour's time, but the shovelling of the coal by hand still takes two days. The machine illustrated in Fig. 1 is the result of an effort

feet. In sweeping across the room the gathering plate and its flights load out not only all the coal on this 4-foot arcuate strip of floor, but also all the coal which falls when the first 4 feet of coal are removed.

When the pile is 5 feet high 7 feet of coal fall into the machine for each square foot of floor space traversed by the sweep, as the angle of repose for coal in the pile is 40 degrees, on the 4-foot strip 28 cubic feet of coal fall into the machine for each foot of movement across the room. The sweep moves across the room at the rate of 2 feet in one minute, and gathers something over 40 feet of coal per minute. When the coal is not so high

\* Extracts from a paper read before the Engineers' Club of Columbus, Ohio, by Wm. E. Hamilton.

in the pile the rate of feeding across the room can be increased at the pleasure of the runner to a speed of 5 feet per minute, which will keep the machine full, if the coal on the floor is but 2 feet deep.

The conveyors are 12 inches wide, 8 inches deep, with a flare edge of 8 inches, so they will accommodate any lump which will lie in a trough 18 inches wide, and the machine has no difficulty in loading as large lumps as can be passed between the roof and the top of the car, much larger than can be loaded by hand.

The sweep is from 12 to 16 feet long and can swing through an arc of 180 degrees, and will reach from rib to rib in any of the usual size rooms. The speed of chain travel in the first conveyor, or sweep, is 80 feet per minute. When the coal passing over this conveyor averages 6 feet deep the machine is loading 40 cubic feet, or 1 ton, of coal per minute. The second conveyor, or picking table, travels faster than the sweep conveyor, although both are driven from the same head shaft, as shown in Fig. 2. The driving sprocket for the sweep is 8 inches in diameter and for the second conveyor 10 inches. This faster travel is an advantage in that it carries the coal away from the hopper as fast as it is discharged thereon. The flights are closer together on the second conveyor, and this also prevents the coal from congesting at the hopper, and at the same time the coal is spread out over the conveyor and can be picked and cleaned of slate and bone to better advantage.

At the end of the machine where the coal is discharged into the pit car the chain and flights pass around the sheave wheel and the flights fold up and enter the return guide folded back against the chain. In this way less room is required and the machine is made neater and much more compact. The principal reason, however, for managing the flights in this way is to prevent their spanking the lumps off of the car as it fills.

The action of the flights in folding up as they pass around the rear wheel crowds the coal away from the end of the conveyor and fills up the end and corners of the car, then the car itself will move as the flights continue to push against the coal. In this way the car is moved out a little at a time and is automatically filled. The pushing out of the car by the flights does not strain the chain unduly. Ordinarily a 2-ton car can be started on an iron track, if it is level, with 100 pounds draw bar pull. The chain of the conveyor is  $\frac{1}{2}$ -inch iron and good for 4000 pounds working strain.

As soon as the car is loaded, which requires three or four minutes, a friction clutch is thrown by the runner. This stops the feeding and, loading and starts the car puller drums. These drums are separate, but are engaged by the same clutch. A  $\frac{3}{8}$ -inch wire rope from one of the drums is hooked to one end of the coal car and the rope from the other drum runs under the car and out to the room neck, where it passes around the sheave block and back to be hooked to the front end of the car. The drums are on the same shaft, and when one is in gear the other is free to spin and pay out rope. The largest cars can be handled by the machine and in less time than a horse and driver can handle them. In order not to delay machines it has been found advisable to use a short stub switch and siding in each room for the storage of empty cars. By this provision five or six loads can be ready for the motor at the neck of each room every hour. The machine is operated by two men and has a capacity of about 100 tons of run-of-mine coal per day of eight hours. It is equipped with a light trolley pole for convenience on haulage ways, but in entering the room the ordinary feed cable is used.

The power required to run the machine in loading is about 17 amperes at 250 volts. A larger type of this machine is adapted to use in coal yards, ore docks, quarries, storage piles and many places where loose material is to be rehandled.

Sanction has been given for the carrying out of what is known as the Kashmir project in the State of Mysore, India, and plans are under way looking to the installation of a hydro-electric station capable of furnishing 17,000 horse-power, which is to supply power for an electric

railroad 200 miles in length, for a large dredging outfit and for lighting and other power purposes. It is not at all improbable that the single phase alternating current system will be used on this road.

### Recent Customs Decisions.

The reappraisal division of the Board of United States General Appraisers has handed down decisions covering questions of entered, or invoice values in a number of cases. As is usual in protests of this character, the names of the American importers are withheld by the customs authorities.

#### Steel Spring Wire.

General Appraiser Fischer has sustained the invoice prices on a large consignment of steel spring wire exported by Eicken & Co., Hagen. The appraiser of the port of New York imposed advances on the values of the invoice, but Mr. Fischer fails to uphold his action.

#### Wire Rat Traps.

Wire rat traps from Henri Marty, Villefranche, and entered at Boston, were advanced 30 per cent. over invoice prices by the appraiser at the latter port. As the accruing penalties amount to 30 per cent., the total increase is 60 per cent. The importers asked for a reappraisal, and Judge Waite of the General Board heard the testimony in the case. He sustains the appraiser in his heavy increases.

#### Enameled Steel Ware.

General Appraiser Fischer has sustained the action of Appraiser Whitehead at New York in advancing invoices covering enameled steel ware from Franz Western, Budweis. The advances cover a variety of goods and are quite substantial.

#### Magnesia Rods.

General Appraiser Sharretts has imposed increases on prices quoted for 100,000 magnesia rods exported by Fensterer & Ruhe, Berlin. The rods were entered at New York, and were advanced by the local appraiser from 3.90 to 4.75 francs per 1000.

#### Steel Wire Rope Samples.

General Appraiser De Vries has decided that the appraiser at New York committed no error in placing dutiable values on samples of steel wire rope. The samples came from Frederick Smith & Co., Halifax, England, and were invoiced as of no commercial value.

#### Antimony Oxide.

Mr. Fischer has decided an appeal of an importer regarding the values to be placed on 14,946 kilos of antimony oxide, exported by Poulenc Freres, Paris. The goods are advanced from 70 to 90 francs per 100 kilos.

#### Cold Rolled Steel in Strips.

The Board of United States General Appraisers has completed the taking of testimony in the new test case brought by the Treasury Department to determine whether certain strip steel or cold rolled steel, imported by the Crucible Steel Company of America, Hermann Boker & Co., and other firms, is subject to an additional duty of 1 cent per pound. William J. Gibson has filed a final brief which clearly shows the annoyance caused to importers by the Secretary's action. The counsel says in part: "The Circuit Court of Appeals in this case has placed its decision on the grounds that are unassailable as long as the language of the statute remains the same, and I do not know how the board can do otherwise than follow that decision. In view of that decision this question should not have been raised again on this merchandise. It becomes then nothing more than vexatious." John A. Kemp, the Government counsel, has also filed a brief.

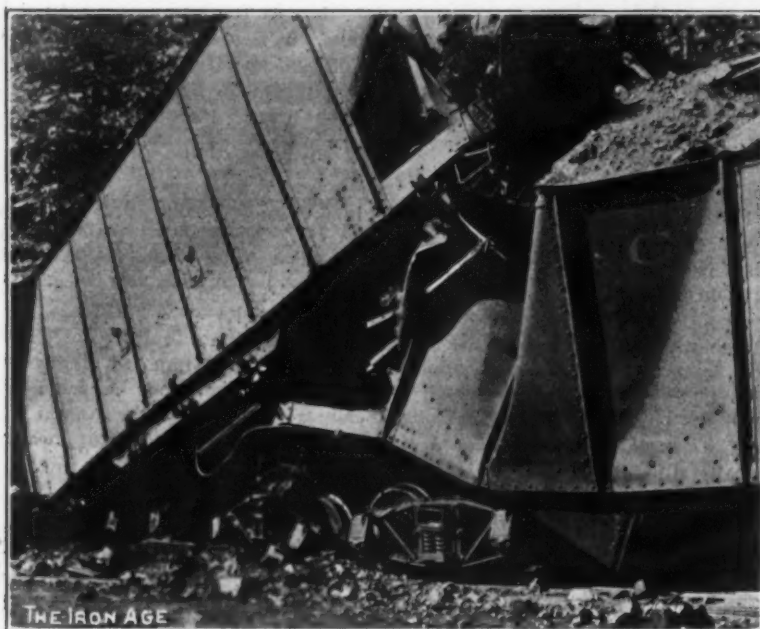
The Ensley steel plant of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., in October broke its best previous record with an output of 23,078 gross tons. Joseph A. Durfee, formerly connected with the Colorado Fuel & Iron Company, took charge of the plant as general superintendent October 1.



### Behavior of Steel Cars in Collision.

The accompanying illustration, showing the position of two steel coal cars in a collision, is from a photograph taken by J. S. Burrows, a member of the United States Geological Survey, who happened to be present when the accident occurred. The wreck occurred September 16 at Thurmond, on the Loup Creek branch of the Chesapeake & Ohio Railroad.

The cars shown were a part of a train of more than 20 cars, each loaded with about 50 tons of coal. The train, a double header, or, in other words, drawn by two locomotives, had crossed the summit of the Loup Creek grade and begun the descent when the air brakes refused to work. By the time the hand brakes were applied the train was beyond control. The engineers tied down their whistle cords and with their firemen and other trainmen jumped to the ground at a point 15 miles from the place where the collision occurred. At the bottom of this grade a bridge spans New River, connecting the Loup Creek branch with the main line of the Chesapeake & Ohio on the north side of the river. Standing on this bridge was a long



Behavior of Steel Cars in Collision.

train of loaded coal cars with a pusher locomotive at the rear headed toward the main line. The engineer of the pusher hearing the runaway train behind him and not having time to get under way abandoned his throttle. His locomotive was struck by the two locomotives attached to the runaway train. All three locomotives were completely wrecked, as was also a wooden box car immediately in the rear of the two runaway locomotives. The only other break in the runaway train was that shown in the picture.

Between these two cars were three loaded wooden coal cars. The force of the collision drove the car shown at the left of the picture up and over the wooden cars completely demolishing them. The cars back of this point all of them built of steel were practically uninjured. When the car shown at the right of the picture was pulled away by the wrecking crew it was found that the wreckage of the three wooden cars was so tightly jammed under the other car that it was not only unsafe, but almost impossible to remove it, and the car had to be thrown over on its side.

The Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., has decided to discontinue selling its products through agents. On January 1, 1906, it will open sales offices in a number of the leading markets, including New York, Chicago, St. Louis, Cincinnati and possibly other cities, making all sales directly to its customers after that date.

### Pacific Coast Sentiment on the Rate Question.

SAN FRANCISCO, CAL., October 28, 1905.—The proposition to give the Interstate Commerce Commission greater powers in regard to fixing rates for freight has given rise to a division of opinion among our merchants. A great many of them, including many of the wholesale hardware houses, are opposed to it as a matter of expediency, while others favor it as likely to lead to a practical solution of the much disputed question as to the control that the Government should exercise over the transportation business of the country. The majority may be stated, however, to be in favor of the railroad side of the question not because they have any particular love for railroad methods as such, but because the interests of the Pacific Coast jobbing trade happen to be in line with the existing system of freight rates on the overland railroads.

The system of making a flat charge, so much per pound per mile, without relation to the interests of any particular locality is one that at first sight would seem to be fair and just. Many so regard it. Of course, these take no note of the fact that it is easier and cheaper to handle large quantities of merchandise, such as hardware, iron, &c., than it is small quantities, and that long hauls cause less trouble than short ones. They also forget that in cities like those on the Pacific Coast water carriage around the Horn is much cheaper than land carriage by rail, and that the roads must give special inducements to our merchants to freight their goods by rail instead of by water.

We have what is called a postage stamp system by which a flat rate is made, say, for New York to San Francisco, Portland, Seattle and Tacoma, and where the retail trade is practically obliged to buy in these cities. The rate, of course, is lower than it would be on the principle of so much per ton per mile, and New York and other manufacturing cities of the Atlantic Coast can deliver goods here cheaper than can those of the Middle West. This prevents the great jobbers of the Middle West from capturing the trade of our Pacific Coast jobbers. This is why our importers and jobbers are in favor of leaving things about as they are. There was great fear here at the time that

the Interstate Commerce Commission met that this would be upset, but the conclusion was that sea competition rendered the case of the Pacific Coast jobber an exceptional one.

Up to the present San Francisco and California have received but little benefit from the work being done on the Panama Canal. The merchants of this city expected that large quantities of supplies would be ordered from San Francisco for this side of the canal, but that expectation has not been justified by results. However, there are some signs at last that something will be done in this matter. Proposals will be received by D. W. Ross, the agent and purchasing officer of the Canal Commission, at 36 New Montgomery street, this city, up to 10.30 a.m., November 11, for planing mill machinery, mowing and grinding machines, washing machines, nuts, iron pipe, round iron, steel brushes, screw taps and dies, bits, threading and cutting tools, thread gauges, saw blades, marine clocks, vault doors, wire cable, pulleys, turnbuckles, printing presses and type, locks, hoes, rakes, &c. This will give something to work on to our hardware and implement houses, and may prove to be the beginning of extensive orders.

J. O. L.

It is denied by officials of the United States Rubber Company that that corporation has any intention of acquiring control of the Boston Belting Company, although rumors to that effect have been rife in stock market circles for some time.

## Lake Mining Matters.

### Figures of Ore Shipments.

DULUTH, MINN., November 4, 1905.—Total shipments from the upper lakes in October were about 4,000,000 gross tons, making the season's business to November 1 the enormous total of 29,500,000 tons. A sharp falling off is due in a few days, for many contract ships are about through for the season, but the total will be well up to highest estimates made during the summer. Minnesota shipments for the month of October amounted to 2,817,486 tons, as follows: Duluth, Missabe & Northern Railroad, 1,108,598 tons; Duluth & Iron Range, 1,001,259 tons; both these roads are the property of the United States Steel Corporation, and 707,629 tons by the Great Northern. The latter road is nearly through for the year, as some of its largest shippers have very little more ore to move. Minnesota mines have shipped to the close of October 19,500,000 tons, which is 6,000,000 tons more than the total for all of 1904. There is now a car shortage at lower lake points and shipments are delayed thereby, as ore cannot be moved off the docks fast enough to give room for more. Ore freights for belated buyers have advanced sharply and \$1 has been paid this week for cargoes from Duluth to Chicago and from Escanaba to Lake Erie, but these charters are few and have little bearing on the general market. An advance to \$1 from Escanaba to Lake Erie is 45 cents over contract season rates.

### Ore Prices.

It has been reported from Cleveland that some ore is being sold for 1906 delivery at 25 cents over 1905 base prices, which would make Old Range Bessemers bring \$4, Mesaba Bessemers \$3.75, Old Range non-Bessemers \$3.45 and Mesaba non-Bessemers \$3.25. This may be true, but if it is sellers at this price are letting go ore for next year at a lower price than has been prevailing for some time for 1905 delivery. A lot of Mesaba ore has been sold of late for this fall shipment at up to \$3.85, and there is no question that \$4 would be readily paid to-day for considerable quantities for fall shipment. It is not probable that any very large quantity of lake ore will be sold for next year at a lower price than it would bring to-day, and the standard for the season is more likely to be an advance of 50 cents than 25.

It is not at all strange that these advances in prices and the greater demand from furnacemen for Bessemer mines are having effect on royalties demanded for new mines. One large Mesaba range fee interest has recently leased a mine at a rate of 75 cents a ton for the royalty for ore in the ground, and is not letting any more go even at that high figure. An offer has been made within the past few days of a straight \$1 royalty for a small mine on the east end of the range. In this latter case the offer was not accepted, as the owners figured they would be able to make considerably more by mining and selling their own ore. They have a standard Bessemer, though in very small tonnage, there being less than 500,000 tons shown in the deposit, but it is close to the surface and can be mined very cheaply. This deposit lies 2 miles from a railroad, but a track is to be put in at once and it is figured that selling at \$4, Lake Erie ports, there is a profit of \$2 in the mining of this deposit, based on prices that the operators up this way expect to be general next season.

### Pushing New Mine Work.

The parties who are opening the famous old section 30, T 63-11, Vermillion range, now have their shaft down 30 feet and are sinking at the rate of 18 inches a day. This shaft is near the point where the first drill hole sunk by D. E. Woodbridge for the Clergues of Sault Ste. Marie found ore at shallow depth. It is 350 feet north of the south line of lot 3, 30-63-11, and about the same distance west of the east line. It is following a drill hole that cut ore in place at 130 feet. The shaft is three compartment, 4.5 x 12 feet inside timbers, and vertical. It will go down at least 300 feet and crosscuts will be driven at levels above. A sufficient machinery plant has been ordered and will be on the ground in a few days.

This consists of a hoist and Rand compressor to which three drills will be attached. The management expects to sink about 24 inches a day, double shift, after the air is installed, for the rock is very hard and difficult of penetration.

More work is now under way on the Vermillion range than for years. Several drills are working in T 62-14 and with encouraging results as far as can be ascertained. Sections 13, 14 and 15 show the greater activity, and not only have drills been taken there but large concerns have optioned considerable tracts to be drilled later. In sections 4, 5 and 6, in the northeast corner of this township, the Oliver Iron Mining Company and some others are at work and the Oliver work is said to be very satisfactory. On the west side of 62-13 some work is under way and a number of options have been taken by operating companies on which exploration is to begin shortly. Sections 4, 5, 7 and 8 in this township are most favorably regarded and are showing the best indications. On the north line of T 61-15, just south of the Soudan mines of the Oliver Iron Mining Company, drills are working in the Roy and La Chance tracts, and it is reported that iron ore has been cut in considerable deposits. There is some talk of work east of Ely, but nothing has started there yet aside from the section 30 shaft, as above mentioned. Of course while favorable indications have been met in some of the operations under way, and while some ore may have been found by drills this all does not mean that a mine has been found or necessarily that it will be found, for the Vermillion is well known as a most disappointing district. Millions have been spent there in the search for ore, but so far nothing of value has been found aside from the Soudan and Ely deposits. I think that diamond drilling is less adapted for work on this range than on most and that much of the success of the district, if it is to be successful, will rise from work by means of shafts and drifts and crosscuts, which are, after all, the real way of getting information as to the character of formations and of ores below surface.

Nearly 200,000 tons have been shipped from the old Soudan mines, on the Vermillion range, and this has had some effect in stimulating exploration in the district. Not only have these mines made good shipments, but their shafts are to be deepened and new ore bodies to be opened. No. 8 shaft, now 1300 feet deep, is to be sunk to 1500 feet this winter to reach an ore body found some years ago by drills. No. 12 shaft, which has been abandoned for some years, is to be reopened and equipped, and it may be that the Lee portion of the mines may be opened and developed.

### Copper Notes.

John L. Harris, for three years superintendent of the Quincy copper mine, Hancock, Lake Superior, has been replaced by Charles L. Lawton, who for the past 90 days has been his assistant. Mr. Lawton was previously superintendent of the Houghton Development Company, Bisbee, Ariz., and has had experience on the Mesaba range. The Quincy mine ten years ago was producing about 2 per cent. copper, but its rock has steadily grown poorer, till now it is making but 0.9 per cent. Though the Quincy is very deep, its shafts reaching slopes at the depth of 5000 feet, its mining costs, exclusive of smelting and construction, are about \$1.50 per ton, which is a remarkably low figure. Its copper has cost of late about 10 cents a pound, which is an increase over some preceding years.

D. E. W.

Comparative trials in Nottingham, England, between motor omnibuses and trolley cars have shown that for cheapness of operation the car is far superior to the omnibus. On the side of maintenance the cost of tires (rubber) for the omnibus figures out at 4 cents per car-mile, as against a corresponding cost for rails for the trolley car of 2½ cents per car-mile. This makes a difference amounting in a year to about \$500 for each vehicle. The motive power of the trolley car was found to be about 24 cents per ton of weight, as against 80 cents for the gasoline motor car. The report does not state what period of time is covered by these latter figures, but it was probably one day.



### The Pittsburgh Coal Washer.

While the coke producing capacity of the country as a whole may have kept pace with the increase in iron producing capacity such is not the case so far as Connellsville coke is concerned. This is indicated by the fact that to-day first-class Connellsville foundry coke is bringing from \$3 to \$3.25 per ton, f.o.b. cars at the ovens, whereas coke from West Virginia and other districts is selling at about \$2.25, or \$1 per ton less. As there is no more coal to be acquired in the Connellsville region increase in the coke production must come from some other field, but up to the present time no coal has been found equal in quality to the Connellsville. There are vast bodies of coal, however, within easy reach of the principal furnaces of the country that would make very superior coke, quite equal to Connellsville in both analysis and structure were it not for the ash and sulphur they contain.

The removing of these impurities and the producing of high grade standard coke is the purpose for which the Pittsburgh Coal Washer Company has recently been organized. The company is composed of men who have long been identified with the coke business, and after much experimenting they have succeeded in producing a washer which they claim will take coal too high in sulphur and ash to make a commercial coke and economically eliminate these impurities sufficiently so that coke strictly up to standard high grade Connellsville coke may be produced.

The company controls the novel principle of separating the coal from its impurities by the automatic regur-

of the form illustrated in Fig. 2. These jigs are made of 3-inch timber dovetailed and bolted together and are 3 feet wide and 7 feet long inside. They are connected at the four corners by substantial sockets and rods to a slotted lever arrangement, which gives them a drop motion about twice as rapid on the downward stroke as on the upward stroke. These jigs run at an average speed of 35 strokes per minute, and the length of the stroke is adjustable to suit different conditions of coal. In the box is placed a perforated bottom, bolted to angles and

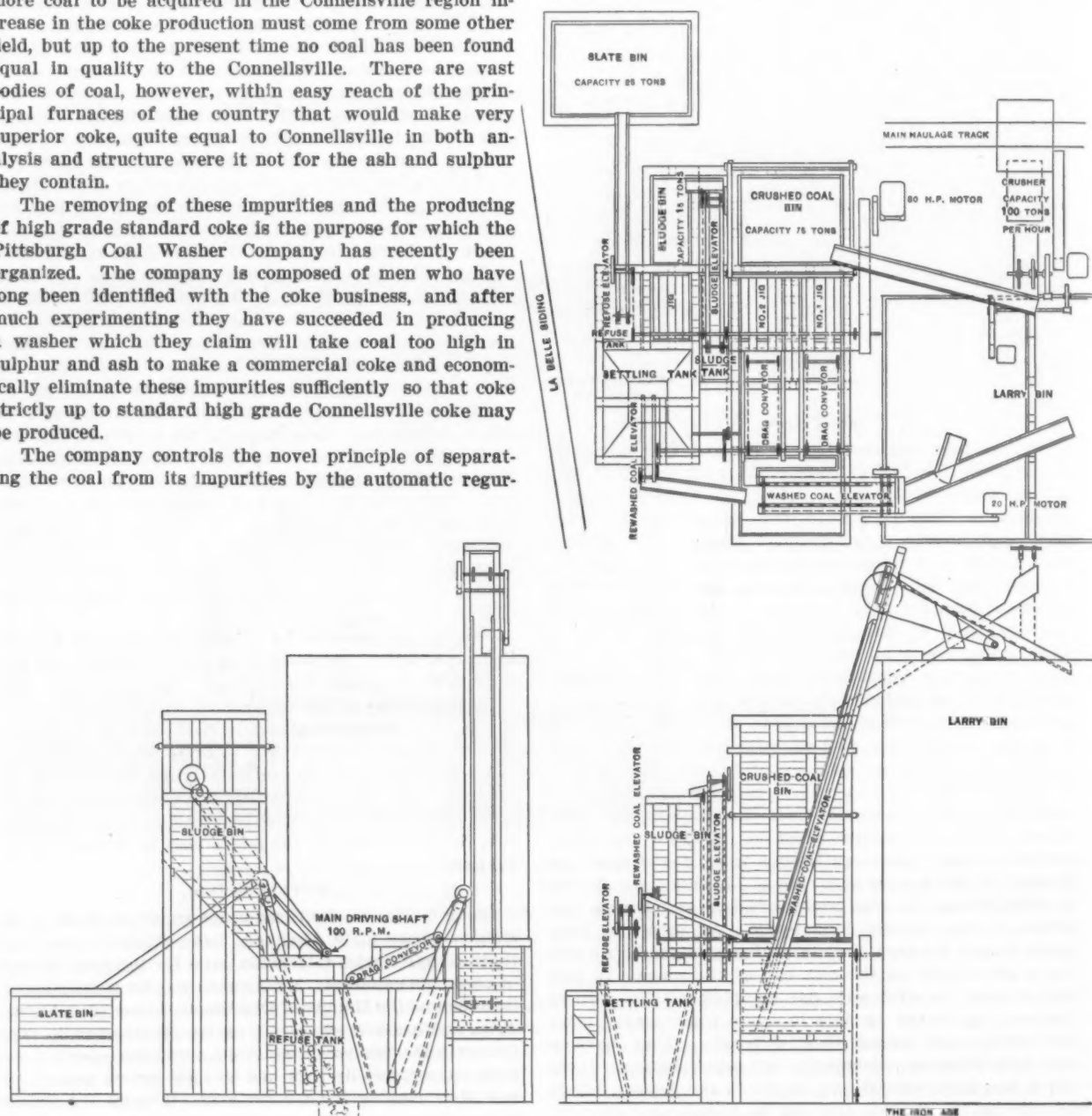


Fig. 1.—Two Side Elevations and Plan of a Complete Coal Washing Equipment.

gitating system of valve bottom jigs, overflow tanks, settling tanks, &c. An important feature of this improved process is in the small amount of water required for practically continuous operation without necessitating a new supply, thereby obviating the need of any special outlay for water supply.

The Pittsburgh coal washer consists of two elementary parts—namely, a primary washing system and a secondary separate washing system. These two parts are driven from one line shaft, making an economical arrangement as to space occupied and power consumed. Fig. 1 shows the arrangement of the washers and the other parts, such as bins, conveyors, &c., which enter into a complete equipment.

The primary washing system consists of one or more drop motion reciprocating valve controlled bottom jigs

channels, and 12 inches below is a solid bottom in which are placed 12 cast iron flap valves and seats. On the downward motion of the jigs the valves open and allow the water to rush in and raise the coal, slate and sulphur from the screen, and on the upward motion of the jig they close and hold the water in the jig, allowing the materials to stratify in comparatively still water. This gives an advantage not to be found in other jigs, as the very fine pyrites settle in the same manner as the heavier particles and do not ride over on the coal. This valve controlled bottom also, it is claimed, enables the washing of a great deal more finely crushed coal without the use of feldspar than any other jig.

The coal must be crushed to  $\frac{1}{2}$ -inch ring or finer, as the only way to eliminate sulphur is to crush the coal so fine that it will have a chance to stratify in the jig.



The jigs are mounted in separate tanks and are fitted with cast iron sliding plates entirely surrounding them, which rub on corresponding plates bolted to the inside of the tanks. In the front of the jigs are gates arranged to draw off the slate and sulphur which are connected to a lever mounted on a quadrant, with suitable dogs to set the slate gates in any position. In the bottom of the jig tanks there are spiral conveyors to convey slate, sulphur and any good coal which has been lost in the primary operation to a tank from which it is elevated to the sludge bin by a bucket and strap link chain elevator. The tanks also have flap valves arranged to admit water on the up motion of the jig and to close on the down, forcing the water through the material in the jig.

As the coal flows over the front of the jig with the water it passes into a screen, from which it is dragged by a drag conveyor to either bins or to a washed coal elevator to be elevated to bins. Under this screen is a tank to catch the water with a spiral conveyor in the bottom of it to catch any fine particles of coal which may have passed through the screen. The spiral conveyor also delivers to the sludge tank. The advantages in the screen is that the coal goes to the bins dryer than if it were conveyed direct from a tank.

The secondary or rewash equipment is a counterpart

drivers of locomotives. An engine driver can be turned in the same place for some time without injuring the rail beyond a slight burning or hardening at the point of contact. The experience of the Boston Elevated Railway goes to show, however, that if the motor wheels of a car are kept turning in one spot for any length of time they will actually cut a heavy rail in two. Cases where trains have been stalled on grades and the motors kept at work in an effort to get started have resulted in the formation in the rails of deep holes where the wheels were revolving. This has made it impossible for the train to get under way with its own power, requiring a push or pull from some outside source of power to start it.

### The New England Foundrymen's Association.

This association has prepared the programme of its season's meetings, which follows: December 13, discussion of brass foundry practice; address by Dr. Richard Moldenke, secretary of the American Foundrymen's Association, Watchung, N. J., on "Tendencies in the Foundry Industry." January 10, annual meeting. February 14, address by J. S. Robeson, president Robeson Process Company, Camden, N. J., on "Core Sands;" address by

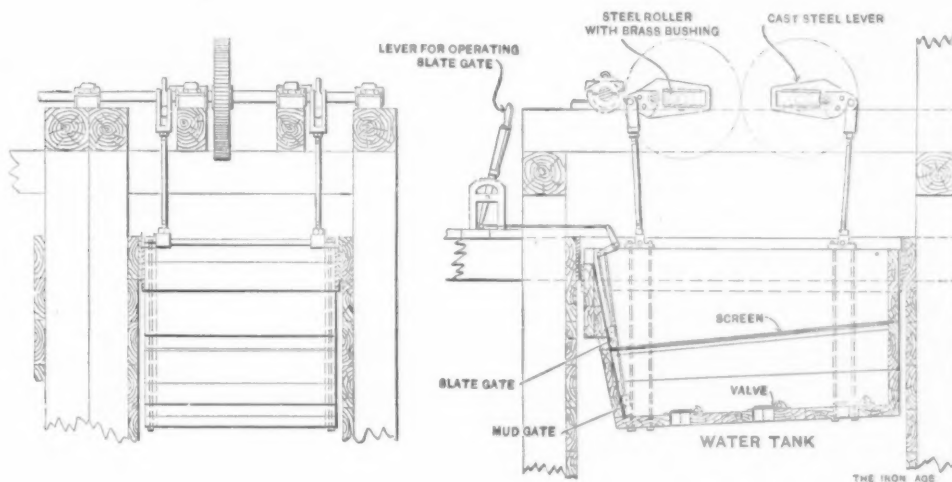


Fig. 2.—Details of the Jigs Used in the Pittsburgh Coal Washer.

of the primary wash as far as the jig is concerned, but in this part of the machine the screens are eliminated and a settling tank with an elevator mounted in it is substituted, as the coal from the rewash is too fine to be dragged over a screen and must be caught by settling in comparatively still water. The water is led back in this part through flap valves under the jig into the jig tank the same as in the primary wash. At one side of the secondary jigs is located the slate tank, from which the slate and refuse is conveyed by a bucket elevator.

With this apparatus one man and a boy can wash 100 tons of coal in eight hours, and it is claimed that more sulphur and ash can be removed from run-of-mine coal by this process than by any other. The refuse does not have over 4 per cent. of coal in it. In severe climates, to prevent danger of freezing, pipe coils are placed in the tanks supplied either with exhaust or live steam.

At present three of these washers are in course of construction in different parts of the country, and all those already erected are giving very satisfactory results. It is quite possible to believe that the building of these washers in the near future will have a marked effect on coke production in different sections of the country, as well as upon the value of the various coal properties of different districts.

The men identified with the Pittsburgh Coal Washer Company are W. Y. Humphreys, R. L. Martin, Harmon Griffin, Harvey Cory and C. M. Clarke, and the offices are located in the Lewis Building, Pittsburgh, Pa.

The effect upon the rails of the traction wheels of electric cars seems to be quite different from that of the

Charles Kirchhoff, editor of *The Iron Age*, on "General Tendencies, Economic and Technical, Which Are Influencing the Development of the Manufacture of Pig Iron." March 14, address on "Maintenance, Storage and Valuation of Patterns," speaker to be announced; address by O. P. Briggs, commissioner National Founders' Association, Minneapolis, Minn., on "The Best Means of Advancing High Grade Mechanics." April 11, address on "New Aspects of Chemistry in the Foundry," speaker to be announced; address by Prof. Albert Sauveur, manager Boston Testing Laboratories, on "Relation Between the Properties of Cast Iron and Its Structure." May 9, address by James A. Green, senior partner of Matthew Addy & Co., Cincinnati, on "The Future of the Southern Iron Industry."

Long considered a model of efficiency on the Continent, the fire service of the city of Vienna is being much improved by the substitution of automobile chemical engines for those drawn by horses, a total of 53 of the new type having been ordered. It is also proposed to install motor fire engines of the heavier type, and this will probably be done. The change already under way will cost, it is estimated, about \$180,000, but an annual saving of \$15,000 is expected in operating expenses. In view of the fact that the steam pump is used for delivering the water on the fire, it is likely that the engines will be propelled by steam, but the lighter chemical engines, in which the discharging pressure is derived from a chemical action, will probably be operated by electric motors, for the charging of which arrangements will be provided in the several engine houses.

### The Computing of Cylinder Diameters for Blowing Engines.

The chart reproduced herewith shows graphically the ratio of cylinder diameters for blowing engines with Corliss steam gear when operating noncondensing. It shows the proper sizes of cylinders to deliver a maximum air pressure with a minimum steam pressure and represents the practice of the William Tod Company, Youngstown, Ohio, in the design of such engines. As an example of the use of this chart suppose that in a certain furnace the air pressure is occasionally as much as 22 pounds per square inch and the size of the engine is 42 and 84 x 60 inches. If it is desired to know how low the steam pressure may fall and the engine still work within the range of the releasing cut off, follow the horizontal line of 22 pounds per square inch until the curve for a diameter ratio of 2 is reached and note that this will intersect at a vertical line of 97 pounds per square inch. For the same engine operating against 22 pounds pressure, to deter-

### The Bureau of Steam Engineering.

WASHINGTON, D. C., November 7, 1905.—The annual report of Admiral C. W. Rae, chief of the Bureau of Steam Engineering, has just been submitted to the Secretary of the Navy. In addition to reviewing the work of the bureau in the designing of machinery for the new war ships, including turbine engines for battle ships, scout ships and launches, Admiral Rae points out the chief defects in the installations of machinery at the leading navy yards and recommends the purchase of many new tools and the construction of several important buildings.

For the purpose of securing further data in regard to turbine machinery, a representative of the bureau made the passage from Halifax to Liverpool, England, and return on the turbine steamer *Victorian* of the Allan Line. Representatives of the bureau have also been engaged in the testing of turbines at their places of manufacture and plants specially erected for experimental purposes.

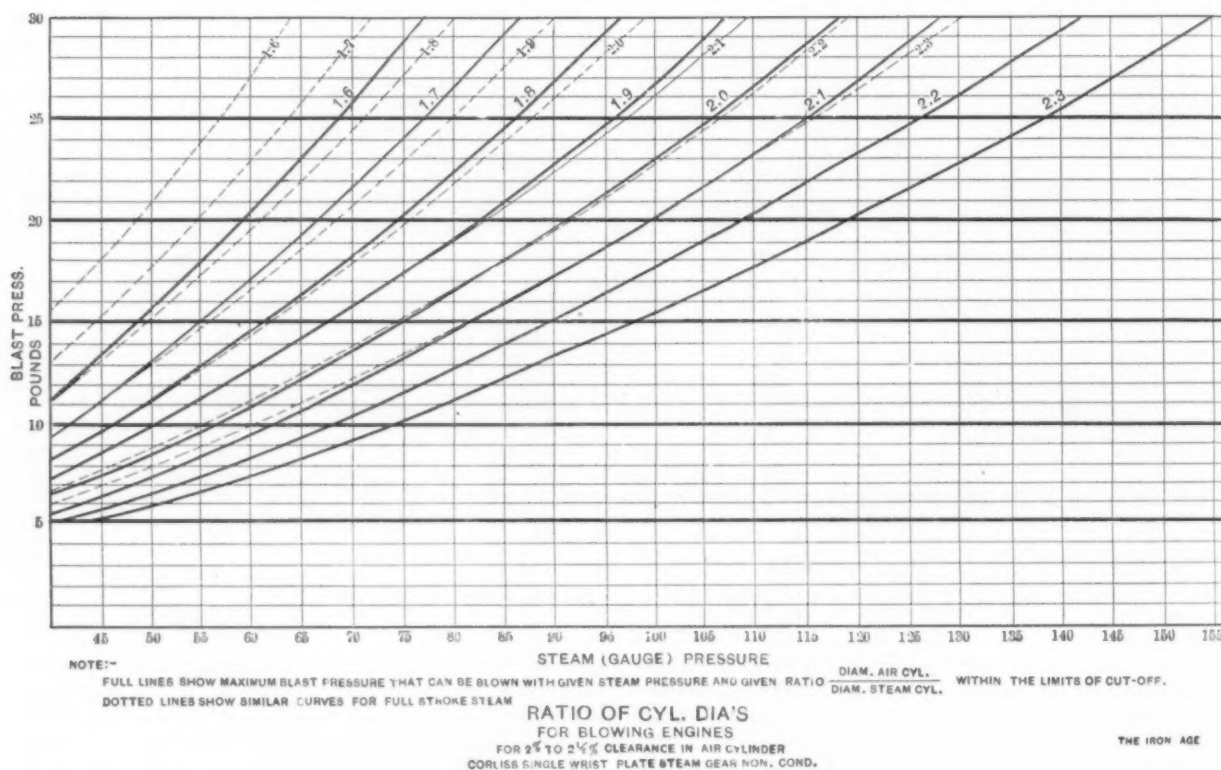


Chart Used by the William Tod Company to Show the Ratio of Cylinder Diameters for Blowing Engines.

mine the minimum steam pressure which would operate the engine, follow the same horizontal line until it intersects the broken line for a cylinder ratio of 2, which, it will be found, intersects on a vertical line representing a steam pressure of 82 pounds. The deduction is that the engine would stall at about 82 pounds and would carry the hooks at less than 97 pounds.

A new system of electric line poles is attracting considerable attention in Europe. A wooden pole with spikes fitted in it forms a core. Around the outside of these spikes is wound a sheet of wire gauze of large mesh, while a layer of cement 2 inches thick is put over the gauze. This is found to make a very solid pole, which is not acted upon by the weather; it lasts as well as an iron pole and costs only about one-half as much. Cross arms are fitted by means of curved iron pieces bolted so as to embrace the pole. A line 30 miles in length has been erected. The poles are 45 feet apart, measure 12 inches in diameter at the base, and 8 at the top and are about 40 feet long. The portion planted in the ground measures about 5 feet in length.

A number of tentative plans and calculations were made in connection with the designs for the new battle ships, Nos. 26 and 27—the *South Carolina* and the *Michigan*—the plans embodying provisions for the reciprocating engines and steam turbines. With the object of deciding on a standard arrangement and type of machinery for 50-foot launches, estimates and designs were received from several of the navy yards, and also from outside firms, embracing a variety of machinery. Of these designs one is building at Portsmouth and will be fitted with steam turbines.

Tests have been made by a board ordered under instructions from the bureau to determine the value of superheated as compared with saturated steam, on boilers designed for marine use. These tests were carried out on a large ore carrying vessel, the *James C. Wallace*, recently put into service on the Great Lakes. The steam pressure carried was about 250 pounds, and the comparison shows a decided economy in coal consumption by superheating the steam about 58 degrees F. above the temperature of saturated steam.

A number of gasoline launches are building at navy yards, and this type of engine will be used on the ferry

launches for Indian Head and Portsmouth. The bureau expects to be able to build gasoline engines within weight limits in closer conformity to its professional views regarding requirements of durability and power.

During the fiscal year 1905 the bureau experts inspected 50,113,847 pounds of engineering material. The total number of firms and establishments doing work for the Government requiring inspection is 318, an increase of 32 per cent. over last year. Since these manufacturing establishments are scattered, the bureau has established at convenient points headquarters for nine inspection districts. At present but six commissioned officers are available for the nine districts. The bureau renews its recommendation that young line officers be ordered to duty with the present naval inspectors of engineering material. To assist the naval inspectors of engineering material the bureau has a staff of civilian assistant inspectors, obtained by competitive examinations. At Pittsburgh and South Bethlehem, Pa., the bureau has well equipped chemical laboratories.

In the past all auxiliary machinery for Government ships were sent to the shipyard, where only a superficial inspection was possible. Now the bureau insists upon a full and careful inspection of the materials entering into these auxiliary engines. This bureau also inspects all the structural material used in the construction of the storehouses and shops for navy yards and naval stations; also the structural material and machinery for coal handling apparatus and coal storage plants.

#### Needed Machine Shop Equipment.

Regarding the requirements of the leading navy yards and naval stations in the way of machine shop equipment, Admiral Rae submits a statement in part, as follows:

**Portsmouth Navy Yard.**—A machine shop is nearing completion. The bureau asks for \$100,000 for new tools for this yard. It also asks for the completion of the boiler shop and pattern shop authorized, and for the construction of a foundry, forge, coppersmith and pipe fitting shop and a storehouse.

**Boston Navy Yard.**—A copper shop and the extension of the foundry wing are asked for and \$50,000 for new tools.

**New York Navy Yard.**—A new copper shop is needed; also a building for the storage of completed machinery, material for immediate use and patterns. The extension of the brass foundry is asked for.

**League Island Navy Yard.**—The new shops for the steam engineering department have been completed and are now being equipped. A building for the storage of material, piping, material, foundry supplies, &c., is asked for.

**Norfolk Navy Yard.**—Changes in existing buildings and the construction of a building for the storage of machinery are asked for. An estimate of \$40,000 is made for new tools.

**Charleston Navy Yard.**—A boiler shop, pattern shop and administration building are asked for. It is proposed to move the machine shop from Port Royal to this yard and an estimate of \$100,000 is made for necessary tools.

**Naval Station, Key West.**—The most urgent need is a foundry. The present building is 36 x 70 feet and was built in 1875. It has not sufficient capacity for an emergency and a new building will be required in the near future.

**Pensacola Navy Yard.**—The steam engineering plant must be materially enlarged. A new machine shop, with modern tools and appliances, is now a necessity. During the year a lathe, drill press, boring machine, shaper, planer, bolt cutter, pipe cutter and threading machine, small power hack saw and a sensitive drill press have been installed. Many new tools have become an absolute necessity. An estimate of \$50,000 is made for new tools.

**Mare Island Navy Yard.**—A new foundry, smithery, boiler shop, coppersmith shop, pattern shop and administration building are recommended.

For the naval station at Cavite, \$50,000 is asked for new tools. A steam engineering building is recommended at Guantanamo, Cuba, and \$40,000 for tools.

With regard to increasing the number of officers available for duty as engineers it is suggested that in the line there shall be a number of engineering specialists whose duty both at sea and on shore shall be engineering. The number of such officers has been fixed at one in every ten above the rank of lieutenant, junior grade. The final result of this plan would give a body of engineering specialists in the line of the navy of at least 82, of whom 62, the lieutenant commanders and lieutenants, would be available for sea duty, say 30 at sea at any one time.

W. L. C.

#### The Milwaukee School of Trades.

The Milwaukee School of Trades is expected to open for the instruction of students in various lines November 16. It will be conducted under the auspices of the Merchants' and Manufacturers' Association, Milwaukee, Wis., but will have its own officers, directors and Executive Committee, which will have full charge. Maintenance of the school will be through voluntary subscriptions, and the fees paid by students. A guarantee fund has been subscribed by a number of large manufacturers, which can be called for as necessity may require. The school is located at 156-158 Clinton street, which is the property formerly used by Pawling & Harnischfeger as their office and principal machine shops.

The branches of instruction, which will be undertaken at the present time, are mechanical drawing, machine designing, plumbing and wood and metal pattern making. It is not intended to confine the operation of the school to these courses alone. Those desiring instruction in other trades will be given the opportunity as the school becomes well established. The complete list of directors is as follows:

F. W. Sivy, president Northwestern Malleable Iron Company; John I. Beggs, president Milwaukee Electric Railway & Lighting Company; J. W. P. Lombard, president National Exchange Bank; Gardner P. Stickney, secretary Wisconsin Trust Company; O. H. Falk, secretary Falk Mfg. Company; Louis Auer, real estate; A. J. Lindemann, president A. J. Lindemann & Hoverson Company; E. G. Pratt, president Milwaukee Gas Light Company; Charles Quarles, attorney; George H. D. Johnson; Carroll G. Pearse, superintendent of schools; T. L. Smith, Smith Machine Company; Walter Read, secretary Filer & Stowell Company; H. H. Cutler, vice-president Cutler-Hammer Mfg. Company; J. S. Church; Geo. B. Ferry, architect; A. O. Smith, president A. O. Smith Company; C. E. McLennan, principal of high school; Charles D. Crane, architect.

The officers of the school are: President, F. W. Sivy; secretary, G. E. Hutchinson; treasurer, J. W. P. Lombard; Executive Committee: F. W. Sivy, chairman; James S. Church, Walter Read, A. J. Lindemann and T. L. Smith.

**Soft Metal Capping for Projectiles.**—The theory of the capping of the sharp ends of heavy projectiles with soft metal is stated in a new way by a German engineering journal. One explanation of the protective character evinced by the cap was that it acted as a "lubricant" to the harder metal when engaged in piercing the armor plate. Another purported to explain the action on the ground that the cap took up the shock of impact like a railway buffer; in other words, that it absorbed the amount of energy which would otherwise cause the destruction of the projectile. In the essay before us the reason given is the following: That the superior action of the capped projectile rests on the fact that the point of the projectile is not deformed at the first instant of impact with the plate. Due to the intervention of the cap, the pressure is not confined simply to the point, but is distributed uniformly over a fairly large cross section. The unit pressure therefore does not exceed the limit above which the tempered material of the projectile would be impaired. As a consequence the point is not deformed at the first instant of impact, but pierces like a chisel into the hard layers of armor plate. At this stage the cap has fulfilled its mission and the projectile goes on its way alone and uninjured.





manufacturing may be kept as low as possible, to insure an advantageous position in bidding for business and at the same time insure the fair profit which encourages enlargement of works and the increase of pay roll that goes with growth, and which also encourages new industries to add their wealth producing presence to the city.

There is another side to this New Britain instance which other cities and towns may take to themselves. The tendency of Eastern manufacturers to locate the extending of their works in the Middle West is a growing one as a natural result of the springing up of dangerous competitors in territory nearer to the Western market and to the source of fuel and iron. In the Middle West taxes on manufacturing property are generally kept as low as possible. In that newer industrial country great keenness is shown in adding new manufacturing, there being a wideawake realization of what the future of a community depends upon. The manufacturers of New Britain and other Eastern cities have already shown an inclination to establish Western plants to take care of Western business. A home city may foster this feeling by a lack of liberality, which begets unpleasant comparisons.

The older cities are pervaded with a false notion of their own advantages to the manufacturer, a notion which voices itself in the claims of the presence of an unusually well trained army of workmen, of the absence of serious labor troubles, of the excellent schools which attract workmen with families of children and so into more trivial details. It is overlooked that labor will go to the manufacturer, that to uproot a great industry and move it elsewhere means loss of employment to many people, and unless employment can be found for them at home they must move to other places. It is forgotten that the single item of freights may mean a profit or lack of profit. These older cities should look ahead a decade or a generation and see the conditions which are now working toward more advantageous geographical locations grown to fulfillment. Not that these older cities will cease to manufacture or necessarily cease to grow, but they will be more and more handicapped for many lines of manufacture which to-day are profitably carried on, and this handicap will be the more vital as the spirit of illiberality is nurtured. It should be kept in mind that coal and raw materials are always beckoning the manufacturer of metal lines to the West, and the market is telling him to save the freight of the fuel and raw materials eastward and of the finished products back westward. In the face of these well recognized facts it is strange to see a New England city making manufacturing conditions even more difficult for its industries.

### The Scarcity of Special Pig Irons.

The way in which pig iron for special purposes has disappeared from the market is one of the features of the present situation. This has always been an accompaniment of an advancing iron market. Charcoal furnaces, whose product to a large extent is special purpose iron, are sold up for months to come and it is very difficult to get such iron for immediate needs. Ferro-manganese has been very scarce for weeks and has steadily risen in price. Ferro-silicon is also practically unobtainable. Makers of low phosphorus iron have had nothing to offer for weeks. Irons low in silicon and high in manganese have been sought unsuccessfully by foundrymen who desired such an iron in their mixtures to increase the strength of their castings or to close the grain. Recourse has been had

In some cases for hardening or strengthening purposes to pig iron running beyond ordinary limits in sulphur. It can be understood that such an opportunity to work off high sulphur irons long piled in his yard would be a welcome surprise to the average furnaceman, and so it has been. But a case is reported in which a foundryman who had failed to find a high manganese iron was disappointed a second time when he ordered as an alternative an iron high in sulphur. The furnace company replied that while ordinarily the clearing out of its high sulphur irons was no occasion for regret it was sorry in this instance because of its inability to serve a customer.

### The Opposition to Trade Schools.

The commission, with Carroll D. Wright at its head, which is studying the question of the establishment of trade or technical schools in Massachusetts, is hearing a good deal of opposition from representatives of labor unions, a fact which is the more important because it promises opposition when the report of the commission shall come up for action before the State Legislature. There is nothing especially new in this attitude of organized labor, excepting it may be its shortsightedness in the face of existing industrial conditions.

The unions are strongly opposed to any form of trade schools which will teach more than the theory of a trade, and they even object to the theory because to possess a knowledge of it might stimulate young men to go farther outside of the school and actually learn the trade itself. It is practically the same argument that was brought against the introduction of labor-saving machinery—namely, that the condition of labor would be lowered. Yet every one should know by this time that the condition of labor has been immeasurably advanced by improvements in machinery, and it is equally true that the greater the proportion of skilled labor the greater the general wealth of a community and the more improved the welfare of its laboring classes. This is well evidenced by existing conditions, for in important lines of manufacturing the lack of skilled labor is seriously interfering with production. In the machine tool business, for example, it is not too much to say that labor itself will be a sufferer by this condition later on, for some part of the business must of necessity be sacrificed, and manufacturers are prone to let foreign orders go to get the greater profit from domestic business, and when business slackens in the American market then the foreign trade will be missed. If there were a sufficiency of skilled labor at this time most builders of machine tools would be fully prepared to take care of even a greater rush of business than exists to-day.

The argument of the union leaders includes the danger that the labor market may be flooded with the half-trained young men of the trade school. That this is a fallacy is apparent, because no skilled workman has anything to fear from the unskilled, unless it be in time of labor troubles, when the undertrained man may be employed in the emergency to maintain production, the loss of which must be contrary to the general good of the community. Manual training has become a part of the American public school system, especially in the high schools, and doubtless serves an excellent purpose. But President Wright's commission is not considering manual training, which is already established in Massachusetts, but the trade schools, where boys may be given the advantage of a trade, with its theory and its practice. If, for instance, the machinist's trade were to be taught it would be rather difficult to grant the union request to



omit practical training, for to omit the machine shop would make such instruction a farce. It is feared by organized labor that the trade school would turn out an excess of labor in certain trades, to reduce the current rates of wages. This would be hardly possible. Of the boys who would enter such a school the annual production of capable journeymen in any one trade would be comparatively small, and as the selection of trade school courses would be influenced largely by the promised financial returns any abnormal condition in a trade would quickly adjust itself.

In actual practice the influence of this form of public school education would be for the good of labor generally. The pupils of the trade schools would be to a great extent the children of workmen, and the additional advantages received would be likely to place the sons in a more advantageous position than their fathers ever held to enable them to rise above the level of the journeyman. This form of systematic education, coupling with the practical and theoretical side of the trade courses in general subjects, and perhaps in mechanical drawing and other practical and useful instruction, must bring the boy above his fellow who ends his period of actual education at the point where the trade school student begins what might be called his post graduate course of the grammar school. We very much doubt if the intelligent classes of labor agree with the protests of the union leaders. That the leaders themselves are not united on the subject was evidenced at the hearings in Massachusetts.

## CORRESPONDENCE.

### The Late Erie-Ohio River Ship Canal.

*To the Editor:* The editorial on the proposed Ohio River and Lake Erie Canal in your issue of October 12 merits the serious consideration of those of your readers interested in the problems involved in freight transportation, and especially of those resident in the Pittsburgh-Mahoning-Shenango district, where the railroad traffic is the heaviest in the world, the region where "freight congestions" are most frequent and most disastrous to manufacturers, miners and general shippers. It seems impossible in this district to keep pace with the demands on the railroads for cars, especially for the movement of coal and coke in the direction of the lakes, and many contracts for time delivery during the past few months have either been annulled or greatly reduced to meet existing conditions.

To enlarge the present facilities for freight between Pittsburgh and the lakes involves such vast expenditure of capital that no important reduction of rates would be possible if the expenditure were made. Even James J. Hill with his "ideal" freight road could not materially relieve the situation. Most of the cost for roads reaching the furnaces and mines about Pittsburgh is incurred in perfecting terminal arrangements. For an example of this, the last road brought into Pittsburgh, the Wabash, will suffice. However, it required the financial endurance of a Gould to perfect such a road, and he will make it a success without a doubt.

Mr. Hill says that "with capital provided he can build a road on modern scientific principles, not required to carry passengers, that would be able to put out of business any waterway having a less depth than 20 feet."

This defiance has been placarded for several years without being seriously challenged. Its author, however, might want to revise his statement if he came to Pittsburgh and investigated the rail and water transportation in the Monongahela Valley. For many miles both banks of the Monongahela are lined with double tracked railroads engaged chiefly in moving coal and coke. The passenger business is quite insignificant and

is purely local. The roads are level, the fall of the river being less than 1 foot per mile. Between the railroads lies the river, improved with locks and dams, at present affording a navigable depth through small locks built prior to 1850 of generally 7 feet depth, although at times for several consecutive weeks during the fall the depth may not exceed 6 feet. (The Government is now rebuilding the locks and dams so that in the future a depth of 11 feet will be available.) The traffic is incessant, night and day, winter and summer, the ice being kept broken up even in zero weather.

One firm in Pittsburgh receives 2,300,000 tons of coal annually by the river. The cost of the transportation of this coal 52 miles through three of the old locks, including return of empty vessels to the mines, is 4 cents per ton. Allowing 5 per cent. on capital invested and 15 per cent. for annual depreciation of steamers and barges the cost to the firm is 9.4 cents per ton, or 0.18 cent per ton per mile. The rail charges on the level "ideal" roads paralleling the river are about 46 cents per ton from the same mines to Pittsburgh, or about 0.80 cent per ton per mile.

Before the United States purchased the locks and dams on the Monongahela the private company which operated them charged a toll of 6 cents per ton on coal from the above mines to Pittsburgh. Coal was about the only traffic of consequence at that time, but the company for many years before and up to the time the Government condemned its locks paid 10 per cent. dividends.

If the same tolls were re-established the present cost from the mines referred to would make the cost to the Pittsburgh firm using the coal 15.4 cents, or about 3 mills per ton per mile, a trifle over one-third the existing rail rate. When the new and much larger locks now under construction are completed, affording nearly double the present navigable depth, transportation charges on the Monongahela will be materially lessened.

For the Ohio River, when improved to Louisville, 600 miles below Pittsburgh, for 9 feet depth, the cost of moving coal, including return of empty barges to Pittsburgh, will be 37.8 cents, or .063 cent per ton per mile. Included in this is 5 per cent. for interest on capital invested and 15 per cent. for annual depreciation of plant. The railroad experts are not always so clear as to what they cover in their freight charges made public. Mr. Hill may double and quadruple his tracks down the Ohio Valley and make passengers take trolley routes, but nothing which runs on wheels and rails through cuts and tunnels and over bridges, all of which must be kept up, can be made to transport freight at as low a rate as is possible on the Ohio River.

The above rates are based on 9 feet depth, leaving 11 feet as a margin on Mr. Hill's 20 feet depth. It can be shown that from Pittsburgh to the mouth of the Beaver River, 25 miles, where the canal to the lakes will leave the river, the 9 feet depth in the Ohio can be increased to 12 feet at comparatively small cost without rebuilding any of the locks and dams now rapidly approaching completion. Discussion as to what may be done with the river to make it correspond with 15 feet canal depth, or of the possibilities of a still greater canal and river depth, cannot be undertaken in limited space and is therefore deferred.

Three thousand-ton boats in any event will certainly be able to pass through the canal. In this connection it is quite unnecessary to assume that lake channel depths must be brought to Pittsburgh before the canal can prove of any benefit to shippers in the Ohio Valley desirous of sending their products to lake ports or through the enlarged Erie Canal to New York City. Such boats once in the lakes can be taken anywhere, whereas lake vessels of over canal depth must transfer their cargoes destined for Pittsburgh. The question simply is, Will such vessels transfer to cars if canal boats will take the freight to destination for about one-third the rail charge?

New York State lost more than ten years talking about the enlargement of the Erie Canal to about 25 feet depth. At some of the conventions in this interest



in the lake cities which the writer has attended the mention of 30 feet depth would bring forth the loudest applause from the assembled merchants. When, however, the State finally acted it decided on 12 feet depth.

If canals take away the bulky low class freight from the railroads the increased population and industries established along their banks will make new and highly profitable business for the roads. The country along the New York railroads and the old canal is a manufacturing desert because of lack of fuel at reasonable rates. If the enlarged canal can change this, surely it will benefit the railroads by benefiting the public. The lower the cost of prime necessities in this country the better it is for every interest. Transportation charges add nothing to the intrinsic value of any article, but they do often prevent articles from being bought and sold. Corn has often been burned for fuel in the Far West when 1 cent a bushel less in freight rates might have permitted it to be shipped to tidewater.

You raised the question of the durability of the Lake Superior ore fields. Sixty years is the shortest period we have heard of named by Mr. Schwab several years ago, since which time extensive fields have been discovered in Wisconsin. When all the ore fails then the railroads will suffer for want of new rails. Possibly the ore supply might give out much sooner than anticipated. We can't be too much in a hurry therefore to build the canal to the lakes, because something must be left to do business with, else Buffalo, Cleveland and the rest will freeze to death for want of coal.

THOMAS P. ROBERTS.

PITTSBURGH, November 1, 1905.

*To the Editor:* Referring to the above letter of T. P. Roberts, it is easy for Mr. Hill to say he can build a railroad that will put out of business a waterway of less than 20 feet depth. The answer to that proposition is also easy. Neither Mr. Hill nor any one else has ever done it. The proof of the pudding is the eating, and facts speak louder than words.

Mr. Roberts' illustration of the situation in the Monongahela Valley shows that a waterway of less than 10 feet depth has been and is now carrying coal at about one-fifth the rate charged by the railroads on its banks; and if the old toll rate was restored it would be about one-third the rail rate. And they are railroads built on modern scientific principles. It is also true that the Ohio River on less than 10 feet depth is carrying coal to New Orleans, 2000 miles, at a cost not exceeding \$1 per ton, as against a probable rail rate of \$8 per ton to the same point, even by a railroad built on modern scientific principles.

Here is an opportunity for Mr. Hill to put his scientific theory into practice and build such road and take for it the 20,000,000 tons of freight annually moved on the Ohio River and its navigable tributaries on less than 10 feet of water. Will he do it? We can assure Mr. Hill that the Ohio River will not be canalized to 20 feet depth during his lifetime nor the generation following, so as to put it in competition with his road.

JOHN E. SHAW,

President Lake Erie & Ohio River Ship Canal Company.  
PITTSBURGH, PA., November 1, 1905.

#### **The Purchase of Machine Tools for the Navy.**

*To the Editor:* I have read with considerable interest that part of your article under "New England Machinery Market" in your issue of October 26 which relates to the equipment of the several departments in the navy with machine tools. Certainly all that is expressed in your article can be readily verified and many other instances added. It is certainly a move in the right direction to call attention to the manner in which improved machine tools are constantly overlooked by the authorities in Washington and purchases made of inferior tools owing to the supposed economy of a system of purchasing from the lowest bidder. It would certainly result in a great improvement in the efficiency of the Navy Department if the attention of the several Congressmen in whose districts large quantities of machine tools are manu-

factured were called to this matter of "modern tool" equipment.

Not long ago one of the Eastern yards installed several high duty water tube boilers of a modern type to the extent of the appropriation then available. Upon the assembling of Congress during the next year additional appropriations were obtained to enable the Department to complete the installation of additional boilers required to supply the needed power. Bids were asked for in the usual form and when they were opened it was found that another maker had bid a small amount less for what they claimed were equally efficient boilers. This other maker of boilers, however, required an entirely different up-take between the boiler and the flue and necessitated the reconstruction of the main flue running through the boiler room, at an expense of very nearly \$1000, which expense far exceeded the difference in price saved by purchasing the low bid; besides, it gave the boiler room a job lot look.

I recall another instance where the requisition was made for an 11-inch tool room lathe, with all the usual attachments required and furnished with such an outfit. The bids on this tool varied nearly \$300, and when the Department received the lathe which was purchased it proved to be one of those amateur lathes such as are frequently sold to satisfy schoolboys with a mechanical inclination, which may or may not develop into anything more than a little fun. The result was that almost the first job that was put on this lathe, such as it would have ordinarily been required to do, broke the headstock, and the Government purchased another lathe in due time.

Again, when certain bids were under consideration in the Department at Washington, the clerk claimed a greater advantage by purchasing the low bid because, as he said, "you got more lathe for less money, as it would take in more between centers," and this criticism applied to a 27-inch lathe. From that standpoint the builder of a powerful lathe with the required weight in the head and tail stock did not even receive a casual consideration.

I know that other instances in the same line could be repeated and verified by every one in the machine tool business, and in each instance the Government is the loser, the service crippled, and the efficiency of the Department thwarted.

If there is one thing that needs rectifying more than any other in the purchase of naval supplies for the Government it is the practice of allowing civil service clerks, whose ability may be without question for what they were originally engaged, assuming the position of judging as to the excellence of machine tools by the price which is asked for them in place of this deciding power being exercised by the captains or other officers in charge of the several departments at the different navy yards, who are held responsible for the work which is to be done by these same tools and who, after spending considerable time determining what is wanted and providing the necessary specifications covering them, are entirely ignored when the question arises as to what shall be purchased, for the value of a tool for a specific class of work is rarely to be determined by the percentage of difference in the several costs.

I appreciate the effort which you have made in calling attention to this deplorable condition and hope that the results will eventually be of material benefit to our country.

ENGINEER.

BOSTON, MASS., October 30, 1905.

The Atchison Railroad is having 1500 steel underframe box cars built by the Standard Steel Car Company, Butler, Pa., from which place the cars will be sent to Pittsburgh mills to be loaded with steel products for shipment to Western points. The same road is having 650 all steel flat cars built by the Pressed Steel Car Company at its plant at McKee's Rocks, Pittsburgh, and these cars will be loaded with structural steel and such other material as can be placed on them for shipment west. The cars are being completed at the rate of about 30 a day, and the fact that they are to be loaded before leaving for their destination will in a measure relieve the car famine now existing in the Pittsburgh district.

## Iron Ore Analysis at Lake Superior Mines.\*

BY W. A. SIERENTHAL, REPUBLIC, MICH.

The idea of compiling the methods used in the laboratories of the iron mining companies of the Lake Superior district in the analysis of iron ores was suggested by the work of Francis G. Phillips on "Methods for the Analysis of Ores, Pig Iron and Steel," published by the Engineers' Society of Western Pennsylvania, 1896, and later in book form by the Chemical Publishing Company. The plan therein carried out has been followed in the present inquiry. A letter was addressed to each of the chemists whose name and address the writer was able to obtain requesting a description of the methods used in the analysis of iron ores in the determination of iron, phosphorus and such other substances as might be determined. The responses were quite general, but few of those addressed failing to send in a description of the methods employed.

The intention is not to present a scientific treatise on iron ore analysis, but to set forth in some detail the methods of procedure carried out in the daily work in the analysis of iron ores which furnishes the basis for the grading of the ores and the commercial transactions of the mining companies. Because of the limited time allowable for analyses and the accuracy and reliability that results must present we believe that in the Lake Superior district the methods employed are as rapid and at the same time as reliable as may be found in use in any section in the commercial analysis of iron ores. That the present compilation is in many respects crude and imperfect we are well aware. The attempt was made to reach all the chemists of the region and the desire was to give all an opportunity to contribute to the work. No doubt some may have been missed.

The reports coming from the chemists of the different mining sections are distributed as follows: From Minnesota five, representing the Vermillion and Mesaba ranges; from the Gogebic range six, from the Menominee range five, from the Crystal Falls district two, from Marquette County three, from the Baraboo district, Wisconsin, two, and from Ontario one. Total, 24.

Two methods are in general use in the determination of iron. The permanganate method, familiar to most of us, is used by seventeen chemists; the other, the bichromate method, by but seven.

### Three Methods for Phosphorus.

In the determination of phosphorus three general methods are described with varying modifications in manipulation. One the Handy alkalimetric method, in which the phosphorus is precipitated as yellow ammonium phosphomolybdate dissolved in standard sodium hydrate and titrated with standard nitric acid, is used by twenty of the chemists. The Emmerton method, in which the yellow precipitate is dissolved in ammonium hydrate, reduced with zinc and sulphuric acid and titrated with potassium permanganate, is used by three; and a modification of the Wood method, described in Blair's "Chemical Analysis of Iron," in which the phosphorus is determined gravimetrically by weighing the yellow ammonium phosphomolybdate precipitate, is used by one of the chemists. In some instances two methods are reported by some of the chemists.

Two methods of more than the usual rapidity are described, one by John McNamara of Ironwood, the other by F. A. Janson, of Vulcan, Mich., both being modifications of the Handy method.

In the determination of silica two methods are described. The sodium carbonate fusion method is used by seven; the hydrofluoric acid method by four. Both are used by some of the chemists.

Volhard's method for manganese, with various modifications, is used by fourteen of the chemists; Julien's method by one, and a gravimetric process is described by one.

Of those reporting methods for the determination of calcium, ten use a gravimetric method, precipitating the calcium as calcium oxalate, igniting and weighing as cal-

cium oxide (CaO). One uses a volumetric process, titrating with potassium permanganate.

Magnesia is determined gravimetrically as magnesium pyrophosphate by six, and alumina as aluminum phosphate by nine of the chemists who report methods for such determinations.

Sulphur is determined as barium sulphate by those reporting on the determination.

One chemist describes a method for the determination of titanium.

Methods for moisture determination are described by four and for organic and volatile matter by three chemists.

### The Value of Comparisons.

The interest and value of this collation of methods to the chemists of the district it seems to me is to be obtained from the differences in details and manipulation as well as in the general differences of methods. Already I have found myself making some changes in my own work, applying some of the details given by some of the chemists in their descriptions.

In conclusion, while some of the methods described may be as rapid and reliable as any in general use, it seems to me that there is a possibility for improvement and an excellent opportunity for research along the line of both shortening and simplifying some of the methods given, especially in the determination of phosphorus. A method for the direct oxidation and dissolving of the phosphorus without the complete solution of the ore would greatly simplify the process.

The two methods given for the determination of iron are quite simple when compared with those described for other substances; yet each has certain objections—the permanganate method, because of the inconstancy of strength of the solution; the bichromate method, because it is slower and requires the use of an external indicator.

An internal indicator would be a decided improvement in the bichromate method. Keeping the permanganate solution under some gas rather than in contact with the air might remedy the objection to the permanganate method.

**La Belle Iron Works Record.**—The open hearth steel plant and blooming mill of the La Belle Iron Works, Steubenville, Ohio, made some new records in October. The plant contains 9 furnaces, but one of these was idle half the month, so that with 8½ furnaces working continuously the open hearth plant made a total of 32,710 gross tons, the best previous record, 30,135 tons, having been made in May, 1905. The highest tonnage for one day was made October 27, when 1383 tons were turned out. The best weekly record was 142 heats for the 8½ furnaces and an output of 8685 tons. Furnace No. 1 made a total of 70 heats during October, producing 4230 tons of steel, which is claimed is a world's record for a 50-ton basic furnace. The blooming mill rolled a total of 27,465 tons of ingots during the month, the best previous record having been about 26,000 tons. W. D. Crawford is general manager of this plant and these records certainly reflect great credit on his management.

**The Youngstown Sheet & Tube Company.**—The directors of this company held a meeting at Youngstown, Ohio, last week, at which the following officers were elected: James A. Campbell, president; H. G. Dalton of Cleveland, vice-president; Richard Garlick, treasurer; George E. Day, secretary and general sales agent, and W. B. Jones, auditor. The only change made was in the formal election of Mr. Jones as auditor, he having been filling this position for about three years. Reports submitted to the directors by James A. Campbell on the progress of the work on the new Bessemer steel plant were very satisfactory. It is expected to be making steel by July, 1906, and will have a capacity of about 1500 tons a day.

The late Archibald P. Head and Colonel Leandro Cubillo of Tubia, Spain, are the joint authors of a very elaborate paper on "The Manufacture of Cartridge Cases for Quick Firing Guns," read before the Institution of Mechanical Engineers at London.

\* A paper read before the Lake Superior Mining Institute, Iron Mountain, Mich., meeting, October, 1905.



## A Record in Pig Iron Production.

**An Output of 2,053,127 Tons of Coke and Anthracite Iron in October.**

The production of pig iron in the United States in October exceeded all records, reaching 2,053,127 tons for the coke and anthracite furnaces, to which is to be added about 30,000 tons for the charcoal furnaces. The rate of production for the country is therefore closely approaching 24,500,000 tons a year. The steel works furnaces increased their output about 108,000 tons over that of September and the merchant furnaces about 45,000 tons. Apart from the fact that October is a 31-day month, the record made was due to the excellent working of most furnaces. A number of stacks were compelled to blow out in the month, however, and the net gain in furnaces active on November 1 was only two over the number reported active on October 1. The following table shows the production for October as compared with previous months:

Monthly Pig Iron Production.					
	June. (30 days)	July. (31 days)	August. (31 days)	September. (30 days)	October. (31 days)
New York....	97,234	91,839	102,090	102,419	111,503
New Jersey...	27,879	23,613	25,500	24,030	27,530
Lehigh Valley.	50,953	51,092	46,329	47,044	53,028
Schuylkill Val.	44,164	35,569	34,372	37,120	40,390
Lower Susquehanna and Lebanon Val.	68,731	70,245	72,203	69,997	71,901
Pittsburgh dis.	476,696	467,026	488,119	449,632	495,379
Shenango Val.	112,880	109,753	137,181	151,804	169,388
West Penn...	106,883	110,761	107,225	100,882	107,880
Md., Va. and Kentucky...	71,314	73,235	76,975	77,230	81,539
Wheeling dis.	67,823	71,577	75,502	98,097	110,736
Mahoning Val.	118,138	120,284	126,274	153,758	166,465
Central and North, Ohio.	124,601	106,139	136,161	151,233	162,452
Hocking Valley and Hanging Rock .....	30,482	27,676	29,374	31,166	27,796
Ill., Mich., Minn., Wis., Mo. and Col. ....	233,298	224,011	221,542	242,733	251,864
Alabama .....	124,264	126,949	131,261	129,779	144,804
Tennessee, No. Carolina and Georgia ....	37,948	32,166	33,565	32,576	30,472
<b>Totals....</b>	<b>1,793,289</b>	<b>1,741,935</b>	<b>1,843,673</b>	<b>1,899,500</b>	<b>2,053,127</b>

**Production of Steel Companies.**—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Ashland, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of product month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.				
Pig.—Total production.	Spiegeleisen and ferromanganese.			
	1903.	1904.	1905.	1905.
January .....	502,994	1,129,042	6,673	21,002
February .....	756,260	1,027,937	12,961	22,431
March .....	913,412	1,232,255	23,128	21,280
April .....	966,850	974,006	1,222,710	29,145
May .....	1,037,325	927,534	1,287,438	25,755
June .....	1,021,839	788,822	1,149,404	24,950
July .....	987,855	694,892	1,114,409	27,284
August .....	993,564	747,570	1,186,050	19,280
September .....	956,363	936,494	1,262,033	20,723
October .....	829,215	971,447	1,370,960	13,669
November .....	553,067	962,384	.....	13,442
December .....	406,730	1,019,841	.....	13,325

Among furnaces blown in in October were one Lackawanna at Buffalo, Topton in the Schuylkill Valley, one Bethlehem in the Lehigh Valley, Alice and one Shenango in the Shenango Valley, Buena Vista in Virginia, one La Belle in the Wheeling district, one Bay View in Wisconsin and one Sheffield in Alabama.

Furnaces blown out in October include one Brooke in the Schuylkill Valley, Kittanning in Western Pennsylvania, one Sheridan in the Lebanon Valley, Marting and Union in the Hanging Rock District, one Calumet at

South Chicago and Struthers in the Mahoning Valley.

The table below gives the active capacity of the coke and anthracite furnaces on November 1 and October 1, 1905. It shows that the weekly capacity of furnaces in operation on November 1, based on their records in October, was 460,449 tons, as compared with a total of 445,468 tons on October 1:

*Coke and Anthracite Furnaces in Blast.*

Location of furnaces.	Total number of stacks.	November 1.		October 1.	
		Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York:					
Buffalo .....	12	11	23,436	10	21,499
Other New York...	11	2	1,743	2	1,798
New Jersey.....	8	6	6,003	6	5,403
Spiegel .....	2	1	203	1	204
Pennsylvania:					
Lehigh Valley.....	27	17	11,738	16	10,614
Spiegel .....	2	2	399	2	363
Schuylkill Valley...	13	7	8,771	8	9,193
Lower Susquehanna.	10	6	8,421	6	8,405
Lebanon Valley....	12	10	7,658	11	8,394
Pittsburgh district.	39	37	108,562	38	104,485
Spiegel .....	4	4	3,297	3	3,296
Shenango Valley....	21	19	38,598	17	35,421
West. Penn.....	24	17	24,136	17	23,548
Maryland .....	5	4	7,234	4	6,721
Wheeling district....	13	11	25,004	11	22,889
Ohio:					
Mahoning Valley...	16	15	35,234	15	34,800
Central and North- ern and Mich.....	18	17	38,241	17	37,702
Hocking Valley and Hanging Rock....	11	8	4,839	10	7,272
Illinois .....	20	16	36,917	17	38,085
Spiegel .....	2	2	1,500	2	1,550
Minnesota .....	1	1	1,183	1	1,248
Wisconsin .....	5	4	4,658	3	3,433
Missouri .....	1	1	876	1	1,064
Colorado .....	4	3	8,536	4	8,611
Spiegel .....	1	1	659	0	0
The South:					
Virginia .....	23	14	10,711	13	10,234
Kentucky .....	8	2	1,080	2	1,228
Alabama .....	45	29	33,934	28	30,865
Tennessee .....	16	11	6,878	11	7,143
Georgia .....	1	0	0	0	0
North Carolina....	1	0	0	0	0
<b>Totals.....</b>	<b>376</b>	<b>278</b>	<b>460,449</b>	<b>276</b>	<b>445,468</b>

For a series of months the active coke and anthracite capacity fluctuated as follows in gross tons:

Capacity per week.	Capacity per week.
November 1, 1905....460,449	December 1, 1903....244,156
October 1.....445,468	November 1.....273,715
September 1.....412,563	October 1.....353,142
August 1.....410,088	September 1.....360,197
July 1.....408,617	August 1.....353,681
June 1.....443,092	July 1.....384,825
May 1.....452,031	June 1.....388,178
April 1.....439,564	May 1.....375,496
March 1.....403,157	April 1.....386,215
February 1.....405,792	March 1.....347,424
January 1, 1905....377,879	February 1.....335,339
December 1, 1904....357,846	January 1, 1903....346,073
November 1.....334,249	December 1, 1902....336,617
October 1.....319,240	November 1.....330,110
September 1.....291,573	October 1.....337,837
August 1.....246,092	September 1.....328,243
July 1.....272,301	August 1.....328,745
June 1.....336,197	July 1.....303,793
May 1.....368,244	June 1.....337,492
April 1.....337,257	May 1.....337,627
March 1.....308,751	April 1.....331,140
February 1.....273,692	March 1.....316,039
January 1, 1904....185,636	February 1.....325,440
	January 1, 1902....291,992

About 500 men are involved in the strike of molders and coremakers in 15 Philadelphia machinery foundries. The coremakers went out on October 23 and on October 25 came the sympathetic strike of molders. As recognition of the union is one of the issues in the strike, the foundry proprietors held a meeting on October 27 and decided to operate open shops hereafter.

An excellent illustration of the heavy buying movement in pig iron is furnished by some interesting statistics on the sales made by the well known firm of merchants, Rogers, Brown & Co. During October the sales of all the different offices of this firm amounted to 238,852 tons, which compares with 174,540 tons in October, 1904, and 82,250 tons during the corresponding month of 1903.



### Launching of the Joseph G. Butler, Jr.

On November 4 there was launched from the yards of the American Shipbuilding Company at Lorain, Ohio, a new steel ore freighter, to be named in honor of Joseph G. Butler, Jr., general manager of the Brier Hill Iron & Coal Company, Youngstown, Ohio; president of the Bessemer Limestone Company and the Bessemer Pig Iron Association, a heavy stockholder in the Youngstown Sheet & Tube Company, and identified with other manufacturing enterprises in the Mahoning and Shenango valleys.

A remarkable record was made by the American Shipbuilding Company in the building of this new ore boat, the keel having been laid September 6, and it is expected to put her in commission on November 25. The boat is 545 feet over all, 525-foot keel, 55-foot beam and 31 feet deep. She will have triple expansion engines, with cylinders 23½, 38 and 63 inches, with 42-inch stroke. Steam will be furnished by two Scotch boilers 14½ feet in diameter and 11½ feet long, with a working pressure of 180 pounds to the square inch. The boilers will be equipped with the Ellis & Eaves patent system of induced draft. The new boat will be operated by the Tonapah Steamship Company, owned by the Hutchinson & Co. interests, Cleveland, and is the third ore freighter to come out this season owned by this interest, the other two boats being the William A Paine and John Stanton.

A large number of friends of Mr. Butler were invited by the American Shipbuilding Company to witness the launching. Among those present were Col. J. M. Schoonmaker, president of the Pittsburgh & Lake Erie Railroad, together with his assistant, B. C. Vaughn; C. H. Perkins of the Pennsylvania Lines West; Mr. and Mrs. Butler, their grandson, Joseph G. Butler; Ezra S. Adams and Robert A. Walker of *The Iron Age*, together with a large party of friends of Mr. Butler from Youngstown. The boat was christened by Miss Josephine Butler Ford, a 13-year-old granddaughter of Mr. Butler. After the launching the party adjourned to the Union Club in Cleveland as guests of the American Shipbuilding Company, where a luncheon was served.

**Duquesne Steel Works Record.**—All records for output at the Duquesne Steel Works of the Carnegie Steel Company were broken in October, every department of this plant having very much beaten its best previous record. The following table shows the record of each department of the Duquesne plant in October and its best previous record, as follows:

Department.	October record. Gross tons.	Previous record. Gross tons.
Bessemer .....	60,644	60,005
Open hearth.....	46,230	45,720
Forty-inch.....	35,385	34,247
Fourteen-inch .....	22,872	17,353
Ten-inch .....	7,821	7,330
Eight-inch .....	1,092	734

The broken records had been considered very good and those made last month will likely stand for some time.

The *Engineering News* refers to the fact that a French architect of international reputation has been in the United States for some time endeavoring to let a contract for furnishing about 9000 tons of structural steel. The deliveries were to extend over a period of four or five years and the conditions of the contract are said to have been very attractive. It was found impossible, however, to find an American firm willing to name any moderate price on the contract, and after an unsuccessful search the architect has decided to return and let the contract in Europe.

The American Pig Iron Storage Warrant Company had on hand on October 31, 1905, 71,500 tons of pig iron, 1900 tons of iron having been received and 7600 tons delivered in October. The net reduction of stocks in the month was thus 5700 tons.

The first full census of the Russian Empire was taken in 1897, but the complete results have only now been

published. The total population was 125,680,682. In Siberia there was only 0.53 person to a square verst, while in the Government of St. Petersburg there was 130.40. The population of St. Petersburg was 1,267,023; Moscow, 988,614; Warsaw, 638,208; Odessa, 405,041; Lodz, 315,209. The average size of a Russian family is 5.7 persons, which is even larger than in Germany, where it is 4.6.

## NEWS OF THE WORKS.

### Iron and Steel.

The Combination Steel Company's plant at Chester, Pa., has been acquired by New York capitalists and extensive improvements are now under way to place the plant in proper condition to manufacture a steel specialty. The company which is to occupy the plant has not yet been completely organized.

Frank D. Moses, Trenton, N. J., has purchased the Trenton Steel Works, which are now being repaired preparatory to being placed in operation.

The Knoxville Iron Company, Knoxville, Tenn., has under consideration the construction of a steel plant at Lonsdale.

The Taylor Iron & Steel Company, High Bridge, N. J., has contracted with the Eastern Steel Company, Pottsville, Pa., for the construction of a 200-foot extension to its steel foundry.

F. L. Baldwin, Portsmouth, Ohio, is interested in a company which is being organized for the manufacture of high grade tool steel. It is proposed to incorporate the company with a capital stock of \$50,000, of which half will be used in equipping the plant and half for working capital. The capacity of the plant will be limited at the start to a 24-pot crucible furnace, an ingot heating furnace, furnace for finishing and an annealing furnace. The company will install three steam tilting hammers, 800, 1000 and 4000 pounds respectively, boiler and engine, blower and the necessary shears. A laboratory will be operated in connection with the office. A site is under consideration along the Baltimore & Ohio Southwestern and near the Norfolk & Western Railroad. The product of the plant is to be high speed tool steel as a specialty, together with high grade tool steel and second grade tool steel. Later on it may be decided to take up the manufacture of crucible steel castings and possibly rolled stock, spring steel and other products.

The Dover Pig Iron Company has been organized for the manufacture of pig iron at Bear Spring and Carlisle, Tenn. The following gentlemen are named as the incorporators: John H. Lory, Charles Bruton, S. C. Lewis, T. J. Brandon and James W. Brandon. The capital stock is \$15,000.

On November 3 Robert L. Rice, of the law firm of Tuttle & Rice, Niagara Falls, N. Y., filed a petition of involuntary bankruptcy with the clerk of the District Court in Buffalo against the Ruthenberg Reduction Company on behalf of several creditors. Experimental work has been conducted in a stone building on the lands of the Niagara Falls Power Company. This work, it is intimated, will be continued by others, who are confident of success.

The Iroquois Iron Company, Chicago, is considering the advisability of erecting two blast furnaces on the recently acquired site at South Chicago, instead of one as recently announced. The expenditure in this direction may thus be increased from \$1,000,000 to \$2,000,000. The company is also considering the erection of a battery of by-product coke ovens of sufficient capacity to provide not only the coke for the new furnaces to be erected but also for the two other stacks which now draw their fuel supply from the Connellsville region.

The Truss Steel Tie Company of Pittsburgh has recently installed its system of track construction on the Pittsburgh & Lake Erie Railroad at McKees Rocks and in the New York Subway near 148th street and Lenox avenue, and work is about to begin on the Bessemer & Lake Erie at Euclid, Pa., for similar equipment.

The United Steel Company, Canton, Ohio, is building an addition to its plant consisting of a steel building, 80 x 180 feet, and two smaller structures. These new buildings are being equipped with electric crane and other modern appliances, and all contracts have been placed.

The American Sheet & Tin Plate Company is now operating about 70 per cent. of its tin plate capacity. At its Monessen works, Monessen, Pa., 21 hot mills have recently been started and also 10 mills at its Elwood works, Elwood, Ind. The company is now operating 179 out of 252 hot mills in its various tin plate plants.

Some Youngstown capitalists have purchased the steel roofing plant of the Garry Iron & Steel Company, Cleveland, Ohio, which has been in the hands of receivers for some months. A new company has been formed under the same name as the old, with a capital of \$300,000. Officers have been elected as follows: George D. Wick, president; C. S. Bigby, vice-president, and W. A. Kingsley, secretary and treasurer.

The equipment of the dismantled No. 3 puddling mill at the Brown-Bonnell works of the Republic Iron & Steel Company, Youngstown, Ohio, is being shipped to the plant of the com-

pany at Massillon, Ohio. In addition a large part of the machinery of a number of dismantled plants in Indiana, abandoned on account of lack of fuel, is also being moved to Massillon.

New York Furnace of Miller, Wagoner, Fleser Company, Columbus, Ohio, has been sold to Louis Reed, Columbus, Ohio, who will immediately wreck the stack and sell it for scrap.

One furnace of the La Belle Iron Works, Steubenville, Ohio, was blown in October 17 and the other furnace was banked October 29.

Burden Furnace of the Burden Iron Company, Troy, N. Y., has been dismantled.

Carbon Furnace of the Carbon Iron & Steel Company, Perryville, Pa., will be put in blast the latter part of November.

Buena Vista Furnace of the Allegheny Ore & Iron Company, Buena Vista, Va., was blown in October 28.

La Follette Furnace, La Follette, Tenn., has gone out of blast for rebuilding, which will probably take until the first of the year. The stack will be cut down from 95 feet to 80 feet and refined so as to make it 17 feet 6 inches by 8 feet.

#### General Machinery.

The Howard Iron Works, Buffalo, N. Y., has been reorganized and its capital increased. The company is now in a position to largely increase its business and make further improvements and enlargement of its plant for the manufacture of passenger and freight elevators, transmission machinery, bolt and nut making machinery, castings, &c. The following are the officers and directors: President, H. S. Madden, president of the Sherwood Mfg. Company; vice-president and secretary, R. R. Gardner, president of the Gardner Elevator Company, Detroit, Mich.; treasurer, F. S. Porter, L. L. Lewis, O. N. Gardner and G. H. Gardner.

The Nordyke & Marmon Company, Indianapolis, Ind., will occupy a new building in the near future which will be 104 x 340 feet. While the building was constructed to be ultimately occupied as a foundry it will be used for a year or so as an assembling department in the manufacture of automobiles.

Repairs to the plant of the Weir & Craig Mfg. Company, Chicago, which was damaged by fire a few weeks ago, are about completed. A 75-kw. generator and 100 horse-power in motors purchased from the Jenney Electric Company, Indianapolis, Ind., have been installed. The company manufactures packing house machinery, chain grate stokers, coal and ash conveyors, steam pumps, and plumbers' and steam and gas fitters' supplies.

The Juhl Automatic Hoisting Machine Company, Chicago, has been incorporated with a capital stock of \$12,000 to manufacture hoisting machinery. The incorporators are Thomas J. Morgan, 328 Unity Building; Julius Rubenstein and Joseph Staab.

The Acme Metal & Machine Company, the Fort Worth Boiler Works and the Fort Worth Machine & Foundry Company, at Fort Worth, Texas, have consolidated and will be operated as one concern. M. P. Ferris has bought an interest in the consolidated business and has been elected vice-president. William Richmond is the new president and Charles E. Bowman secretary. The company will build gasoline engines, well drilling outfits, sell and repair gins and cottonseed oil machinery, &c.

Ryther & Pringle, Carthage, N. Y., are building an addition to their machine shop, 50 x 72 feet.

The Westinghouse Machine Company has started upon the erection of its stoker plant at Attica, N. Y.

The La Crosse & Southeastern Railroad Company, operating a new steam road between La Crosse and Viroqua, Wis., has let contract for the construction of car shops, machine shop and power plant at La Crosse. The company is not in the market for machinery at present.

The Monessen Foundry & Machine Company, Monessen, Pa., is building a new machine shop, 80 x 130 feet, and an extension to the foundry, 50 x 72 feet, both of which are expected to be completed by January 1. Two 10-ton traveling cranes will be installed.

The Lima Electric Railway & Lighting Company, Lima, Ohio, has increased its capital stock to \$1,250,000, and is planning to erect new repair shops. The company is not in the market for machinery at the present time.

#### Power Plant Equipment.

The Snow Steam Pump Works, Buffalo, N. Y., was awarded contract by the city of Rock Island, Ill., for an 8,000,000 pump, the company's bid being \$24,990.

The Western Supply & Equipment Company, Winnipeg, Man., was awarded contract on a percentage basis not to exceed \$11,830, for the erection of an electric power house at Indian Head, Sask., N. W. T.

The Westinghouse Machine Company, East Pittsburgh, Pa., manufacturer of the Westinghouse-Parsons steam turbine, has within the last few weeks received numerous orders for its turbines, among them being one from the Lumberton Cotton Mills, Lumberton, N. C., for one 300-kw. turbine; Waltham Gas Light Company, Waltham, Mass., 500-kw. turbines; Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., two 500-kw. turbines; Suburban Electric Company, Scranton, Pa., one 500-kw. turbine; Pennsylvania Light & Power Company, Pittsburgh,

Pa., one 500-kw. turbine; Water, Light & Gas Company, Hutchinson, Kan., one 500-kw. turbine, and the Winston-Salem Power Company, Winston-Salem, N. C., one 750-kw. turbine.

The Milwaukee Common Council has after months of discussion passed an ordinance giving a franchise to the Milwaukee Central Heating Company to erect a central power house and build the necessary tunnels to furnish steam heat to office buildings and dwelling houses. The promoters of this company are connected with the Detroit Central Heating Company, which has been doing business in that city for the past two years.

The General Electric Company, Schenectady, N. Y., has just received an order from the Chicago Edison Company for two 8000-kw. Curtis steam turbines and generators. These machines are each capable of developing 18,000 horse-power. This order is a duplication of one formerly received from the Chicago Edison Company for two similar machines, making a total of four machines for this company. The New York Edison Company has also recently ordered two machines of this size. These are the largest steam turbines ever designed, the six units referred to being capable of producing a total of 108,000 horse-power. The Chicago Edison Company just started up its fourth Curtis turbine unit of 5000-kw. capacity. This company was the first to install and operate a Curtis turbine of this size.

The Foos engine, manufactured by the Foos Gas Engine Company, Springfield, Ohio, received a gold medal as the "best single cylinder horizontal gas engine" at the Lewis and Clark Exposition at Portland, Ore. The Foos engine has taken medals at all the expositions where it has been shown and the company states that it has received many first prizes at various State fairs this fall. Facilities of the plant are overtaxed to fill orders, although the company claims to have the largest exclusive gas engine factory in the country. A further addition to the plant is now under consideration.

The Westinghouse Electric & Mfg. Company has received an order for four 3600 horse-power generators, to be directly connected with the turbines; two 150 horse-power generators, and 23 1200 horse-power transformers, for shipment to St. Croix Falls, Wis. A total of about 12,000 horse-power turbines has also been ordered from the Westinghouse Company for this plant. An order has also been received from the Winchester & Washington City Electric Railway Company, Winchester, Va., for two electric generators of 750 horse-power each to transmit power to Charleston, W. Va., and intermediary points, a distance of 26 miles, for use in cotton mills and small manufacturing plants. The current is to be transferred over long distance lines at a high pressure of 22,000 volts, to save loss.

#### Foundries.

The Illinois Malleable Iron Company, Chicago, is erecting a new warehouse at Diversey avenue and the Chicago & Northwestern Railroad tracks. It will be a mill constructed building, 60 x 200 feet and five stories and basement high.

The Bonham Foundry & Wood Works, Bonham, Texas, has been chartered with a capital of \$7500. Julius Benedict of Weatherford, Texas, and W. W. Sanford are identified with the company.

A stove factory will be started at Beaumont, Texas, by E. W. Sample, lately of West Point, Miss., who will have with him in incorporating the company John H. Brooks, Lou Bernard and A. R. Brown.

The Superior Foundry Company, Cleveland, Ohio, is adding 16,000 square feet of space to its foundry. When the improvement is completed the total working force will number 200 molders and melting capacity will be provided of 65 tons a day. The company recently added a department for the manufacture of plano plates and is now turning out 150 finished plates per day.

The United States Cast Iron Pipe & Foundry Company through its St. Louis office was awarded contract by the city of Independence, Kan., for furnishing 17,363 feet of cast iron pipe ranging from 4 to 16 inches.

The L. H. Goodnow Foundry Company, Fitchburg, Mass., is installing two Niles electric traveling cranes of 5 and 10 tons capacity. These cranes will cover the entire length of the company's main foundry building.

Guy Johnson, managing director of the Red River Furnace Company, Clarksville, Tenn., states that the company has purchased a lot adjoining the furnace for the purpose of building a foundry.

The Southwestern Iron Company, Guthrie, O. T., was recently incorporated with a capital stock of \$25,000, with directors as follows: Judge Dale, Robert Sohlberg, L. H. Lohr, Ben Hegler, C. H. Martindale, Lou Beadles and J. H. Milan. A foundry will be erected on a site 80 x 700 feet. The stock of the Oklahoma Iron Works is being involved to be taken over by the new organization.

The Reder Foundry Company, Chicago, is adding to its plant at Canalport avenue and Johnson street a foundry and pattern shop. The foundry will be one story, 90 x 91 feet, and the pattern shop three stories, 76 x 103 feet. Brick and steel will be used in the construction of the buildings, which, when completed, will cost about \$40,000.

The American Steel Foundries is making some large improvements to its plant at Sharon, Pa., which will considerably in-



crease its capacity. Heavier cranes and new air compressors are being installed and a new shipping and cleaning department is being built. These improvements and additions will be finished by the close of the year and will about double the capacity of the works.

The recent fire at the plant of the Davis & Farnum Mfg. Company, Waltham, Mass., simply burned the roof of the foundry. No loss was sustained on machinery. The building will be immediately repaired.

#### Bridges and Buildings.

The Montague & Pidgeon Iron Company, Memphis, Tenn., has begun the erection of a one-story warehouse at Tennessee street and the Illinois Central Railroad tracks. The building will be 55 x 280 feet and will be utilized for the carrying of bars, sheets, plates and roofing goods. This warehouse greatly increases the company's storage capacity and its location as regards railroad lines will facilitate the prompt execution of orders.

#### Fires.

The Mount Clare saw mill of the Baltimore & Ohio Railroad, Baltimore, Md., was recently destroyed by fire. The loss is placed at \$100,000.

The plant of the Michigan Malleable Iron Company, at Delroy, Mich., was damaged \$50,000 by fire last week.

The plant of the Pittsburgh Wheel Barrow Company, Pittsburgh, Pa., was destroyed by fire last week. The loss is placed at \$20,000.

#### Hardware.

The Western Wheelbarrow & Mfg. Company, Kansas City, Kan., is now operating its new plant in the production of wheelbarrows and trucks of all kinds. The factory has a capacity of 50 dozen barrows and from 50 to 100 trucks per day.

The American Ironing Machine Company, Chicago, has been organized to manufacture ironing machines for use in the home and in small hotels. H. G. Grosse is president of the company, which is located at 100 North Clinton street.

I. J. Shifley, Toledo, Ohio, has invented a machine for making eaves troughing and a company is now being organized by Toledo capitalists for its manufacture. In a test it is stated that the machine made eaves troughing at the rate of 27,000 feet an hour.

Sturges & Burn Mfg. Company, Chicago, Ill., manufacturer of cans, pasteurizers, spiders, griddles and sheet metal specialties, has found it necessary to install some additional presses and increase its working force to provide for the unusually large orders which it reports to have booked ahead for 1906.

#### Miscellaneous.

The Whitlock Coil Pipe Company has recently made large additions to its extensive plant at Hartford, Conn., which include a new brick building, 50 x 200 feet, two stories and basement, affording 20,000 square feet of floor space. This building is now occupied for the sheet metal department, largely for the manufacture of automobile coolers. The building contains a complete buffing and nickel plating outfit, brass finishing and machine shop and tool room. A new office building, 50 x 104 feet, separate and distinct from the remainder of the plant, will soon be ready for occupancy. The product of the Whitlock Coil Pipe Company includes feed water heaters, automobile coolers and high pressure power plant piping, it having facilities to turn out bends and pipe in all sizes from 4 to 30 inches and to furnish the above with Whitlock high pressure steam joints. The company also carries a large stock of pipe up to 30 inches.

C. W. H. Moulton & Co., Somerville, Mass., manufacturers of ladders, have started the erection of a factory building, 50 x 100 feet and four stories.

The Van Dorn Iron Works Company, Cleveland, Ohio, was awarded contract at Hartford, Conn., for the construction of new steel cells at the city police station, the amount of contract being \$43,667. The work includes the tearing out of old brick cells and installing new cells of the most modern type, including water closet and wash basin in each cell, as well as a ventilating system and sliding doors.

The Detroit Steel Pulley Company, Detroit, Mich., will erect a factory building, 40 x 100 feet. Adjoining the factory will be erected a boiler and engine room, which will make the extreme width of the building 66 feet and the extreme length 112 feet. The machinery equipment, which is largely special, and the power units have all been purchased. The factory will be ready for business the latter part of January.

The Ohio Steel Furniture Company has been organized at Youngstown, Ohio, with a capital of \$100,000, to manufacture steel desks, files and furniture of all kinds, and will probably build a plant.

The recent fire at the chain works of the James McKay Company, Pittsburgh, Pa., only slightly damaged the building, no injury being done to the equipment. The plant has been put in operation under a temporary roof.

The American Wire & Supply Company, recently incorporated with a capital stock of \$250,000, has purchased the plant of H. M. Williams & Co., Attleboro, Mass., and will manufacture gold and silver filled seamless wire, tubing and hollow wire,

brass tubing, brass machine made chain, &c. W. Manton Dalley has resigned as general manager of the America Wire Company of Providence, R. I., to become manager of the new company.

The Charter Mfg. Company, Chicago, has incorporated with a capital stock of \$50,000 to take over the business of the Automatic Lubricator Company. The new company will make a specialty of the lubricator for automobiles and gas engines and will also handle spark plugs and fittings and other automobile and railway supplies. The office of the company is at 59 Clark street and the incorporators are F. F. and M. B. Judd and George F. Ramer.

The Robert Aitchison Perforated Metal Company, Chicago, has reorganized and the name of the concern changed to the Aitchison Perforating Company. The business was established in 1868.

The Harris Safety Company, New York, has secured the Sennet plant at Youngstown, Ohio, which it will equip for the manufacture of fire escapes and other safety appliances. The company will install the machinery in its present plant and is not likely to require any new machinery.

The Niagara Forged Steel Company, Buffalo, N. Y., recently organized for the manufacture of underframes, car trucks, special sections, combination tie plates, antirail spreaders, rail braces, rail joints, joist hangers and column caps. W. H. Woodcock is president and engineer, C. L. B. Tylee vice-president and treasurer and George M. Stowe, Jr., secretary and general manager.

The Shone Company, Chicago, a contracting and engineering firm and manufacturer of the Shone pneumatic ejector, will build a new shop and office building at Judson and Blackhawk streets. Equipment will be transferred from the company's present shop at 445 West Forty-sixth street, the property on which the shop is located having been sold to the Commissioners of Small Parks for park purposes.

Thornton N. Motley & Co., New York, dealers in railway supplies, have incorporated with a capital stock of \$10,000.

The Railway Steel Spring Company, New York, has recently received an order from the New York Central Railroad for the equipment of 25,000 freight cars.

## OBITUARY.

EDWARD A. WOOD, founder of the Utica Steam Gauge Works, Utica, N. Y., died at the home of his son, William E. Wood, at Evanston, Ill., October 27, aged 70 years. He was a native of New York and came of a family of expert mechanics. His father, Enos Wood, built some of the first woolen machinery that was made in America. In 1861 the deceased founded the Utica Steam Gauge Company and was actively engaged in that business until he retired, in January, 1900. He is survived by two sons, Allen G., treasurer and general manager of the Utica Steam Gauge Company at New York, and William E., consulting engineer and works manager of J. B. Clow & Sons, Chicago.

EDMOND L. LEVY, for many years active in the management of Neafie & Levy, shipbuilders, Philadelphia, died November 2, aged 65 years. He was born in Philadelphia, and was the son of Captain John Patterson Levy, who was one of the original members of the firm of Neafie & Levy. Upon the death of his father in 1865 Edmond became active in the management of the shipyard, and in 1894 he retired. During his management the firm enjoyed its greatest prosperity. He is survived by one son.

**The Edgar Thomson Rail Record.**—A slight error was made in printing the October record of the Edgar Thomson rail mill of the Carnegie Steel Company, which appeared in these columns last week. The total record of the mill in October was 83,117 gross tons of standard sections, the average being about 85 pounds. The best previous record of the Edgar Thomson mill was 70,444 tons, so that the October record beat all its previous records by 12,673 tons. The best previous record for any rail mill was formerly held by the South Chicago mill of the Illinois Steel Company, which in one month rolled 71,724 tons, so that the Edgar Thomson output in October is still ahead of all records by 11,393 tons. In October the 11 Edgar Thomson blast furnaces made over 143,000 tons of pig iron.

There has just been completed at Plauen, in Saxony, the largest stone span in existence. It is 295 feet 3 inches long.



## The Iron and Metal Trades

October will go down in the history of the Iron industry for record breaking. The monthly statistics of *The Iron Age* show that there were produced by the Anthracite and Coke furnaces of the United States 2,053,127 tons of Pig Iron, which compares with the previous achievement of 1,963,717 tons in May. These figures do not include the output of Charcoal Pig, which may be estimated at about 30,000 tons a month. The Steel companies produced 1,370,960 tons in October, as compared with 1,287,438 tons in May. Of this October product the United States Steel Corporation has 950,752 tons.

The Carnegie Steel Company in October broke 78 past records of production at its furnaces and mills, not counting turn and day records which would greatly add to the number. Thus the Edgar Thomson rail mill made in October 83,568 tons of Steel Rails.

How enormous the output of the Steel works is is proved by the record of the plants of the United States Steel Corporation, which in October produced 1,172,951 gross tons of Ingots.

The Pig Iron markets throughout the country are exceedingly firm, and the conviction seems to be gaining ground that further advances are inevitable. Production, however, is at an enormous rate, our statistics showing that on the 1st instant Coke and Anthracite furnaces having a capacity of 460,000 tons weekly were in operation.

It is understood that the Bessemer Association has shown little disposition to meet the requirement of the Steel Corporation for an option on 15,000 tons of Pig Iron monthly for the first quarter of the year, the total quantity of Association Iron available for that period being only 57,000 tons. There are reports of further sales of Basic Iron in the Eastern markets, but much of these appear to have been made some time since.

There has been some heavy buying of Forge, Foundry and Malleable Iron in New York State from Albany and Troy westward, the bulk of it going to Buffalo furnaces, which have again advanced their prices to the basis of \$17 at furnace for No. 2.

Southern furnaces are now squarely on the basis of \$14 for No. 2 Foundry at Birmingham, but have made only moderate sales lately, being heavily booked.

The demand continues heavy, considering the enormous purchases made during the past two months. Among the large interests which are again in the market may be noted the Cast Iron Pipe industry.

Moderate sales of Steel Rails are reported, with some further heavy contracting in sight. Light Rails have again advanced \$1 per ton and Spikes are higher.

Plate makers are again urging the necessity for higher official prices and this may come at an early date. The demand for Sheets is good, but prices show no improvement. In the Tin Plate trade the leading interest has opposed an advance.

The pressure for deliveries in the Structural trade is enormous. Two contracts for buildings for Chicago calling for about 15,000 tons were let during the week.

In the Merchant Pipe trade the most interesting feature is an inquiry for 600 miles of 6-inch Pipe for an oil line from Kansas City to St. Louis.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,  
Declines in Italics.

At date, one week, one month and one year previous.

Nov. 8, Nov. 1, Oct. 11, Nov. 9,  
1905. 1905. 1905. 1904.

### FIG IRON:

Foundry No. 2, Standard, Philadelphia .....	\$18.00	\$17.75	\$17.25	\$15.50
Foundry No. 2, Southern, Cincinnati .....	16.50	16.25	15.25	15.00
Foundry No. 2, Local, Chicago ..	18.25	17.75	17.25	15.50
Bessemer, Pittsburgh .....	17.85	17.35	16.35	14.85
Gray Forge, Pittsburgh .....	16.35	16.35	15.60	13.85
Lake Superior Charcoal, Chicago ..	18.50	18.50	18.50	16.50

### BILLETS, RAILS, &c.:

Bessemer Billets, Pittsburgh ..	26.00	26.00	25.00	19.50
Forging Billets, Pittsburgh ..	30.00	30.00	29.00	....
Open Hearth Billets, Philadelphia ..	30.00	28.00	28.00	22.00
Wire Rods, Pittsburgh .....	32.00	32.00	31.50	27.00
Steel Rails, Heavy, Eastern Mill ..	28.00	28.00	28.00	28.00

### OLD MATERIAL:

O. Steel Rails, Chicago .....	14.75	14.50	14.50	14.00
O. Steel Rails, Philadelphia ..	18.00	17.50	16.50	14.25
O. Iron Rails, Chicago .....	23.00	22.50	22.00	19.50
O. Iron Rails, Philadelphia ..	24.00	24.00	22.50	17.00
O. Car Wheels, Chicago .....	16.00	16.00	16.00	13.50
O. Car Wheels, Philadelphia ..	17.00	17.00	16.00	13.75
Heavy Steel Scrap, Pittsburgh ..	17.00	16.50	16.50	14.50
Heavy Steel Scrap, Chicago ..	15.25	15.00	14.50	11.75

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia ..	1.83½	1.83½	1.73½	1.43½
Common Iron Bars, Chicago ..	1.85	1.80	1.75	1.45
Common Iron Bars, Pittsburgh ..	1.84½	1.80	1.74½	1.39½
Steel Bars, Tidewater, New York ..	1.64½	1.64½	1.64½	1.44½
Steel Bars, Pittsburgh .....	1.50	1.50	1.50	1.30
Tank Plates, Tidewater, New York ..	1.74½	1.74½	1.74½	1.54½
Tank Plates, Pittsburgh .....	1.60	1.60	1.60	1.40
Beams, Tidewater, New York ..	1.84½	1.84½	1.84½	1.54½
Beams, Pittsburgh .....	1.70	1.70	1.70	1.40
Angles, Tidewater, New York ..	1.84½	1.84½	1.84½	1.54½
Angles, Pittsburgh .....	1.70	1.70	1.70	1.40
Skelp, Grooved Steel, Pittsburgh ..	1.55	1.55	1.50	1.40
Skelp, Sheared Steel, Pittsburgh ..	1.65	1.65	1.55	1.45

### SHEETS, NAILS AND WIRE:

Sheets, No. 27, Pittsburgh .....	2.15	2.15	2.15	2.00
Wire Nails, Pittsburgh .....	1.80	1.80	1.80	1.60
Cut Nails, Pittsburgh .....	1.65	1.65	1.65	1.60
Barb Wire, Galv., Pittsburgh ..	2.25	2.25	2.25	2.05

### METALS:

Copper, New York .....	16.50	16.50	16.62½	13.87½
Spelter, St. Louis .....	6.00	6.15	5.85	5.20
Lead, New York .....	5.25	5.20	4.95	4.45
Lead, St. Louis .....	5.15	5.15	4.92½	4.22½
Tin, New York .....	33.20	33.00	32.20	29.00
Antimony, Hallett, New York ..	12.50	12.50	12.25	7.25
Nickel, New York .....	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York .....	3.49	3.49	3.49	3.49

## Chicago.

FISHER BUILDING, November 8, 1905.—(By Telegraph.)

All lines of Iron and Steel products continue to show added strength from week to week and there is no halting in the upward movement of Pig Iron values. The congestion at the finishing mills continues to increase owing to the heavy specifications that are daily being received, and the large tonnage of new business taken on by the local mills last month, notably of Steel Bars, Light Shapes and Railroad Material, is further complicating the situation in these lines. The new tonnage of Plates and the heavier sections of Structural Shapes that is being taken on is comparatively light and without exception considerably less than mill shipments, thus enabling them to catch up somewhat on deliveries. Another advance of \$1 a ton has been made by Bar Iron manufacturers on material for prompt shipment, and for extended deliveries still higher prices are asked. Light Rails have been advanced \$1 and to small consumers a similar advance has been made on Spikes. Notwithstanding the heavy tonnage of Sheets on manufacturers' books the local market shows signs of weakness and 2.20c. on Black 28-gauge and 3.25c. on Galvanized are quoted on car lots. The indications are that powerful interests are endeavoring to hold the market at this low level, which shows a loss to the independent manufacturer dependent upon the open market for his supply of Sheet Bars. Further advances have been made on all grades of Iron and the anxiety displayed by consumers to cover future requirements is a foreshadowing of still higher prices. Owing to the shortage of Heavy Melting Steel in the Pittsburgh district this market is being sounded and a heavy movement to the East is expected. Prices offered by Pittsburgh consumers, however, do not

warrant shipments, but offers of 50c. a ton better will result in heavy sales. The rate on Heavy Melting Steel from Chicago to Pittsburgh is \$3 a ton, and as this material is now selling at \$15.50, Chicago, \$18.50, Pittsburgh, will have to be secured by local dealers. An intercompany shipment of 5000 tons of Steel Scrap has been already made by the Illinois Steel Company to the Carnegie works at Pittsburgh, and further shipments are contemplated from the stock of 50,000 tons which the Illinois Steel Company has on hand.

**Pig Iron.**—The total sales of the week easily aggregate 15,000 tons, made up almost entirely of small lots, the largest contract specifying 2000 tons of Southern and 4000 tons of Virginia. The continued demand for small lots for prompt shipments, largely from consumers who covered requirements some time ago, indicates that their wants were underestimated and, furthermore, that furnace shipments are growing more irregular. Southern Iron is now firmly established on the basis of \$14, Birmingham, for No. 2 and a few interests are asking \$14.50. Virginia furnaces are offering a small tonnage at \$15.50, furnace, while Northern producers readily secure \$18.50, Chicago, for prompt delivery. Malleable Bessemer is scarce and higher in price, local stacks quoting \$18.50 to \$19. High Silicon grades have been advanced from \$1 to \$1.50 a ton, and only a small tonnage is available at these prices. We revise Chicago quotations as follows:

Lake Superior Charcoal.....	\$18.50 to \$19.00
Northern Coke Foundry, No. 1.....	18.75 to 19.25
Northern Coke Foundry, No. 2.....	18.25 to 18.50
Northern Coke Foundry, No. 3.....	17.75 to 18.00
Northern Scotch, No. 1.....	18.75 to 19.00
Ohio Strong Softeners, No. 1.....	18.80 to 19.05
Ohio Strong Softeners, No. 2.....	18.55 to 18.80
Southern Coke, No. 1.....	18.15 to 18.65
Southern Coke, No. 2.....	17.65 to 18.15
Southern Coke, No. 3.....	17.15 to 17.65
Southern Coke, No. 4.....	16.65 to 17.15
Southern Coke, No. 1 Soft.....	18.15 to 18.65
Southern Coke, No. 2 Soft.....	17.65 to 18.15
Southern Gray Forge and Mottled.....	15.90 to 16.40
Malleable Bessemer.....	18.50 to 19.00
Standard Bessemer.....	18.80 to 19.30
Jackson Co. and Kentucky Silvery, 6 %.....	18.80
Jackson Co. and Kentucky Silvery, 8 %.....	20.80
Jackson Co. and Kentucky Silvery, 10 %.....	22.30

(By Mail.)

**Billets.**—Demand for Forging and Rolling Billets continues light, as all of the large consumers covered their requirements some time ago. The tonnage of Forging Billets now available is limited to the output of one independent mill, and this Steel is held at \$35, with the usual extras in car lots and over.

**Rails and Track Supplies.**—Owing to the heavy tonnage of Light Rails placed last month, which was twice as great as the shipments, prices have been advanced \$1 a ton. The minimum on Spikes is now \$1.85 for large lots and ordinary car lots cannot be placed less than \$1.90. Contracts for Angle Bars and continuous Rail Joints continue heavy, the tonnage taken in October almost equaling that of September. We revise quotations as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 1.85c. to 1.95c.; Track Bolts, 2.40c. to 2.50c., base, Square Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 lb. to 45 lb. Sections, \$26 to \$26.50; 25-lb., \$27 to \$27.50; 20-lb. \$28 to \$28.50; 16-lb. \$29 to \$29.50; 12-lb. \$30 to \$30.50; lighter Sections down to 8-lb., \$35 to \$38, f.o.b. mill. Standard Sections are quoted \$28, f.o.b. mill, full freight to destination.

**Structural Material.**—The new Structural mill of the Illinois Steel Company was placed in operation last Wednesday, when 23 Angles were put through the mill. It will be some time before this tonnage can be figured on, however, and as a large portion of the excess tonnage taken by the Carnegie Steel Company has already been assigned this mill, its output will not relieve the local situation. The congestion at the Structural mills in a number of instances has compelled the use of wood in structures where Steel was specified, but which could not be secured. Demand for material for prompt shipment is not nearly as great as it was several months ago, but jobbers continue to secure premiums ranging from \$8 to \$10 a ton on assorted sizes. For future delivery from mill we make the following quotations: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; Angles larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Tees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.50c. to 3c., according to quantity on hand, in store or obtainable from mill.

**Plates.**—The congestion in Plates is not nearly as great as exists on Steel Bars and Structural Material, and the new business that is being taken on by local mills is considerably below shipments and will enable the mills to catch up on deliveries. While it has been reported that several

Eastern Plate mills are securing premiums of \$2 a ton, material that is being placed in this market continues to be closed at official prices. We quote: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16-inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.10c. to 2.15c.; Flange quality, 25c. extra.

**Sheets.**—The tonnage on the books of the American Sheet & Tin Plate Company, as well as the independent manufacturers, is very heavy, and in view of this situation the low prices that are ruling are inexplicable. Demand for Galvanized Sheets from store is heavy, while specifications from large consumers are above normal, but in the face of this situation mills are compelled to quote on the basis of 3.25c., Pittsburgh, in order to secure business. This is an exceedingly low price when the present cost of Spelter is taken into consideration. Independent Sheet manufacturers not controlling their supply of raw material are now compelled to pay from \$26.50 to \$27 for their Bars on contracts and Steel for immediate delivery is sold as high as \$28 Pittsburgh. We quote as follows: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c. to 2.21½c.; No. 27, 2.26½c. to 2.31½c.; No. 28, 2.36½c. to 2.41½c., with the customary differentials between gauges. Store prices are 2c. to 2.10c. for No. 10 Blue, 2.05 to 2.15c. for No. 12 Box, 2.10c. to 2.20c. for No. 14, 2.20c. to 2.30c. for No. 16, 2.30c. to 2.50c. for Nos. 18 and 20, 2.50c. for Nos. 22 and 24, 2.55c. to 2.65c. for No. 26, 2.60c. to 2.70c. for No. 27, 2.70c. to 2.80c. for No. 28, 2.95c. to 3.05c. for No. 30. Galvanized Sheets are quoted in car lots from mill at the following prices: No. 10, 2.36½c. to 2.41½c.; Nos. 17 to 21, 2.71½c. to 2.76½c.; No. 27, 3.21½c. to 3.26½c.; No. 28, 3.36½c. to 3.41½c. Store prices on Galvanized Sheets are firmer than for some time and high prices are being demanded for sizes difficult to obtain. Prices are as follows: Nos. 10, 12 and 14, 3.10c. to 3.20c.; Nos. 16 to 20, 2.90c. to 3c.; Nos. 22 to 24, 3c. to 3.15c.; No. 26, 3.20c. to 3.35c.; No. 27, 3.40c. to 3.55c.; No. 28, 3.60c. to 3.75c.; No. 34, 4.85c. to 4.95c.

**Bars.**—There has been another advance of \$1 a ton on Iron Bars and we note the sale of 1000 tons for immediate delivery at this price. New Steel Bar tonnage, while limited almost entirely to small lots, continues to exceed mill shipments and deliveries are falling farther behind. Quotations are revised as follows: Iron Bars, 1.85c. Steel Bars, 1.66½c., both half extras; Hoops, 1.91½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

**Merchant Steel.**—The mills continue in receipt of heavy specifications of all classes of merchant material, especially that used by implement and vehicle manufacturers. High Speed Tool Steels are also in big demand and practically all of the mills are from one to two months behind on deliveries. In a few instances premiums are being asked, but as a general rule manufacturers are attempting to hold the market at a conservative level. We make the following quotations: Planished or Smooth Finished Tire Steel, 1.70c.; Iron finish up to 1½ x ½ inch, 1.65c., and Iron finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ¾ and 1 inch, 2c., and 1½-inch and larger, 1.90c., Pittsburgh; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount on car lots and 45 per cent. in less than car lots, in base territory.

**Merchant Pipe.**—Jobbers report a continued heavy movement from stock, which is largely due to the open weather existing throughout this entire territory. As a result, their specifications are exceedingly heavy, and while the mills are receiving little new business from this source shipments on existing contracts are above normal. Current discounts continue to be well maintained and are as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.



**Boiler Tubes.**—Little new business is being placed with the mills, the bulk of the trading being limited to sales from jobbers' stocks. Here and there shading is reported on desirable tonnages, but it is by no means general. Official discounts, f.o.b. Chicago, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1¾ to 2¼ inches.....	50	35	35
2½ inches.....	52½	35	30
2¾ to 5 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

**Cast Iron Pipe.**—While it is customary for the Pipe foundries to commence working on stocks for the following season during the month of November, the leading interest will be unable to begin accumulating a stock at any of its foundries before the middle of December. This is due largely to the open weather that has been existing, not only in this territory but throughout the entire country, and has permitted the laying of pipe much later in the year than is customary. All of the municipal lettings in this territory have been disposed of and very little current business is being placed. Notwithstanding the advances that have been made in the price of Pig Iron, quotations on current business remains unchanged, as follows, f.o.b. Chicago, per net ton: Water Pipe, 4 inch, \$30; 6, 8, 10 and 12 inch, \$29; over 12-inch, \$28, with \$1 extra for Gas Pipe. Very large municipal contracts are placed at a somewhat lower basis.

**Coke.**—Consumers short of Coke are willing to pay almost any price to secure prompt shipment and Connellsville Foundry Coke has sold on the basis of \$3.75 to \$4 at the ovens in car lots during the week. Wise County Coke is quoted at \$4 to \$4.25 at the ovens, equivalent to \$6.25 to \$6.50, Chicago. The Western furnaces continue to experience difficulty in securing an adequate supply of both Connellsville and Virginia Coke, the deliveries last week having been smaller than at any time this year.

**Old Material.**—Pittsburgh consumers of Heavy Melting Steel have been sounding this market during the week, and the indications are that there will be a heavy movement of this material to Pittsburgh mills as soon as Pittsburgh prices reach a basis of \$18 to \$18.50. During the week 5000 tons of Material were shipped from Chicago to Carnegie mills, and further shipments will be made in the near future. The shortage of heavy melting Steel in the Pittsburgh district is said to be greater than during the previous boom when the Western shipments to Pittsburgh were considerable. Slight advances have been made during the week on all Material used by Iron and Steel foundries and Open Hearth plants, and still further advances are anticipated in the near future. The railroads continue to offer big tonnages of varied Material, the lists this week sent out by the Wisconsin Central, Grand Trunk, Chicago, Milwaukee & St. Paul, Omaha line and the Rock Island aggregating 8000 tons. The range of prices paid by large consumers to producers and dealers, in carloads, f.o.b. Chicago, is as follows:

Old Iron Rails.....	\$23.00 to \$23.50
Old Steel Rails, 4 feet and over.....	16.00 to 16.50
Old Steel Rails, less than 4 feet.....	14.75 to 15.25
Heavy Relaying Rails, subject to inspection .....	26.50 to 27.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	15.25 to 15.50
Frogs, Switches and Guards.....	15.25 to 15.50
Mixed Steel.....	13.00 to 13.50

The following quotations are per net ton:

Iron Fish Plates.....	\$18.50 to \$19.00
Iron Car Axles.....	23.00 to 23.50
Steel Car Axles.....	18.00 to 18.50
No. 1 Railroad Wrought.....	17.00 to 17.50
No. 2 Railroad Wrought.....	16.00 to 16.50
Locomotive Tires, smooth.....	14.25 to 14.50
Railway Springs.....	14.00 to 14.50
No. 1 Dealers' Forge.....	14.00 to 14.50
Wrought Pipes and Flues.....	12.50 to 13.00
No. 1 Cut Bushing.....	12.00 to 12.50
Iron Axle Turnings.....	11.75 to 12.00
Soft Steel Axle Turnings.....	11.75 to 12.00
Machine Shop Turnings.....	11.25 to 11.75
Cast Borings.....	9.75 to 10.00
Mixed Borings, &c.....	9.75 to 10.00
No. 1 Mill.....	10.00 to 10.50
Country Sheet.....	9.00 to 9.25
No. 1 Rollers, cut to Sheets and Rings.....	11.75 to 12.25
No. 1 Cast Scrap.....	14.00 to 14.50
Stove Plate and Light Cast Scrap.....	11.50 to 12.00
Railroad Malleable.....	14.50 to 15.00
Agricultural Malleable.....	13.50 to 14.00

The new Structural mill of the Illinois Steel Company, Chicago, was placed in operation on Wednesday, November 1. Twenty-three Angles, 6 x 6 inches, were rolled, only one of which was a second. This was a phenomenal record for a new mill. On account of the adjustments that are always necessary for the smooth operation of a mill of this size it will be several weeks before operations will be carried on continuously and until that time the output will be small. The mill consists of 32 and 28 inch trains of rolls, the former

being the roughing and the latter the finishing train. The roughing rolls are two-high, while the finishing train consists of two stands of three-high rolls and one stand of two-high. The mill was fully described in *The Iron Age* of March 2, 1905. The 40-inch blooming mill, which provides the Blooms for this mill and which was placed in operation last spring, during a five-hour run last week averaged from 90 to 95 tons per hour. This is at the rate of 2000 tons in 24 hours and which no doubt will stand as the record for blooming mills for some time to come. The rated capacity of the mill is 1000 tons a day.

## Pittsburgh.

PARK BUILDING, November 8, 1905.—(By Telegraph.)

**Pig Iron.**—While only a limited tonnage of Pig Iron has been sold in the past week the whole market is exceedingly strong, with prices giving indications of going higher. A local Steel interest has bought in the week upward of 6000 tons of Bessemer and Basic Iron at \$16.50 to \$16.60, Valley furnace, and some good sized inquiries are in the market for Iron for delivery in the first quarter of next year. The absolute minimum of the market to-day on Bessemer and Basic Iron seems to be \$17, Valley furnace, or \$17.85, Pittsburgh, and a few small sales are reported at this price. It is the strong opinion of the whole trade, and this includes buyers and sellers alike, that the Bessemer and Basic market is amply high and that if prices go to \$19 or \$20, as has been predicted, it would have a very bad effect. There is a good deal of inquiry for Foundry Iron and prices are firm, Northern makes of No. 2 being held at \$16.15 and up to \$17, Valley furnace. We note sales of 4000 to 5000 tons of Northern Forge at about \$15.50, Valley furnace, but are advised that some sellers are holding very firmly at \$15.75 to \$16 at furnace.

**Steel.**—There is a fair amount of inquiry, but as previously noted most of the leading consumers are covered by contracts. Bessemer Billets remain on the basis of \$26, while Open Hearth Billets are as scarce as ever and would probably command \$27 or higher, maker's mill. We quote Sheet and Tin Bars in random lengths at \$27, maker's mill, for November delivery.

**Railroad Spikes.**—The demand is very heavy, and the mills are sold up for two or three months ahead. Prices have been advancing steadily, and we now quote \$2 to \$2.05 per 100 lbs., f.o.b. maker's mill.

(By Mail.)

After the great activity which has prevailed in the Pig Iron trade for the past month or more, the rather quiet condition prevailing in the past week is natural and simply indicates that leading consumers are covered for some period ahead and are not in the market as buyers. Prices continue very firm and very little Bessemer or Basic Iron is being offered for delivery this year. Some fair sized inquiries are in the market for first quarter, on which prices ranging from \$16.50 to \$17 at furnace are being quoted. We may say that most of the sales of Bessemer and Basic Iron made in the past two weeks were at \$16.50, Valley furnace, one local Steel company buying last week about 6500 tons of Bessemer and Basic Iron for first quarter delivery at this price. Some of the dealers who have a moderate tonnage of Iron are asking \$16.75 to \$17 for Bessemer and Basic, but so far as we can learn very little tonnage has been sold above \$16.50. The Bessemer Pig Iron Association is out of the market as a seller of Iron for this year's delivery. There is a fair inquiry for Foundry Iron and prices are very firm, Northern No. 2 being held at \$16.75 to \$17 at Valley furnace. Sales of Forge Iron were made last week amounting to upward of 5000 tons, and prices are higher, the Valley furnaces now quoting \$15.75 to \$16 at furnace. The feeling is general that present prices of Pig Iron are amply high and that the interests of both buyer and seller would be best served by holding the market at its present basis. The same condition prevails in Steel, which is very scarce and difficult to obtain for prompt delivery. Bessemer Billets remain at about \$26, Pittsburgh, but some sales for delivery in the Eastern market have been made at a slightly lower price. Open Hearth Billets can hardly be obtained at any price and are held at \$27 or higher, maker's mill, for prompt delivery. Sheet and Tin Bars in random lengths are \$27, maker's mill, for November shipment. The demand for Finished Iron and Steel of all kinds is enormously heavy, and this includes Pipe, Sheets and Tin Plate, which are in much better demand than for some time. The general condition of the whole Iron market is very satisfactory, the principal difficulty of



the mills being to get out material as fast as wanted and on nearly all kinds of which they are behind in shipments.

**Ferromanganese.**—The supply of Ferro for prompt delivery continues scarce and prices are higher, \$65, Pittsburgh, for 80 per cent. Ferro being asked now by practically all sellers. We are advised of sales of a fairly large tonnage of foreign Ferro for forward delivery on the basis of \$65, Pittsburgh.

**Steel Rails.**—No specially large contracts for Rails have been placed in the past week, the largest being about 15,000 tons for an Eastern road, while a Western line placed about 10,000 tons. The mills are so well sold up into next year that in some cases they cannot make deliveries wanted by the roads, usually to commence with spring. A good deal of business is pending, which will be closed between now and the first of the year. We quote Standard Sections at \$28 and Splice Bars 1.50c., at mill. Light Rails are in good demand and prices are firm, as follows: 8-lb., \$36 to \$37; 10-lb., \$32 to \$33; 12-lb., \$29 to \$30; 16-lb., \$27 to \$28; 25-lb. to 45-lb., \$26 to \$26.50, all f.o.b. cars, maker's mill.

**Rods.**—There is a good deal of inquiry, and the market is quite firm. We quote Bessemer and Open Hearth Rods at \$32 to \$32.50 and Open Hearth Chain Rods at \$33, maker's mill.

**Muck Bar.**—There is some inquiry, and the market is very firm. Republic Iron & Steel Company now quotes \$28.25, Youngstown, for best grades of Muck Bar made from all Pig Iron, this price being equal to \$29.20, Pittsburgh.

**Skelp.**—The Skelp market is very firm, the mills having a very large tonnage on their books and being somewhat behind in deliveries. Prices are very firm, and we quote: Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.65c. to 1.70c., and Sheared, 1.75c. to 1.80c. These prices are for ordinary widths and are f.o.b. maker's mill.

**Plates.**—The mills are simply congested with Plate tonnage, especially on the sizes used in the manufacture of Steel cars, specifications pouring in from the Steel car builders at a much faster rate than the mills can turn out the product. None of the leading Plate mills are able to take business for specified delivery inside of six to eight months. The smaller Plate mills are not so well filled and can make reasonably prompt shipments. Prices are very firm and we quote: Tank Plates,  $\frac{1}{4}$  inch thick,  $6\frac{1}{4}$  up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than $\frac{1}{4}$ -inch to and including 3-16-	
inch Plates on thin edge.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.25
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marline, "A. B. M. A.," and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of  $\frac{1}{2}$  of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

**Structural Material.**—The American Bridge Company has closed contracts for about 7500 tons for the extension of the Carson, Pirie, Scott & Co.'s store building, about 6900 tons for Marshall Field & Co., both in Chicago, and has also taken some tonnage for the Delaware, Lackawanna & Western, the balance of the latter going to the McClintic-Marshall Construction Company and Fort Pitt Bridge Company. Bids will soon be asked for the Union National Bank Building in this city, requiring about 8000 tons. Deliveries from the mills are still very unsatisfactory, especially on Structural Steel rolled from Open Hearth stock. The Carnegie Steel Company expects to start this month its new Structural mill at the Clariton Steel Works, which will turn out all sizes of Beams, Channels and other Shapes up to 9 inches and will have a monthly capacity of about 9000 tons. The starting of this mill will help out this concern on deliveries to some extent, and when the new Structural mill now building by the Jones & Laughlin Steel Company has been finished, which will be about April next, the situation will be still further relieved. We quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x  $\frac{1}{4}$  inch thick up to 6 x 6 inches, 1.70c.; Angles, 8 x 8 and 7 x  $3\frac{1}{2}$  inches, 1.80c.; Zees, 3-inch and larger, 1.70c.;

Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Sheets.**—Demand for Sheets is steadily expanding, but as yet prices do not show any betterment. The leading interest is now operating about 90 per cent. of its Sheet capacity and the outside mills are running practically full but are still having trouble in getting prompt deliveries of Sheet Bars. It is the general impression that prices of Sheets will be advanced before long and buyers are placing orders quite freely in anticipation of such action. Prices are firm and we quote: Black Sheets, box annealed, one pass through cold rolls, Nos. 22 and 24 gauge, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.25c.; No. 29, 2.40c., and No. 30 gauge, 2.50c. Galvanized Sheets are firm in price and we quote: Nos. 22 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.10c.; No. 28, 3.30c.; No. 29, 3.55c.; No. 30, 3.80c. We quote No. 28 gauge Painted Roofing Sheets at \$1.60 per square, and Galvanized Roofing Sheets, No. 28 gauge, at \$2.80 for  $2\frac{1}{2}$ -inch corrugation. Jobbers charge the usual advances over these prices for small lots from store.

**Iron and Steel Bars.**—Tonnage in both Iron and Steel Bars continues heavy and the leading mills have their entire output sold up into next year and are considerably behind in deliveries. A great deal of tonnage in both Iron and Steel Bars was placed some time ago before the advance in prices, and specifications on these contracts are coming in very freely. As noted last week, the Republic Iron & Steel Company has advanced prices on Iron Bars, now quoting on the basis of 1.80c., Youngstown, or 1.84 $\frac{1}{2}$ c., Pittsburgh. Steel Bars are 1.50c., base, half extras, for carloads and larger lots.

**Hoops and Bands.**—A moderate amount of current tonnage is being placed and buyers are specifying very freely on contracts. The mills have their output pretty well sold up for the next two or three months or longer. We quote Steel Hoops at 1.75c. and Bands to be used for cooorage purposes at 1.75c., the latter carrying full Hoop and Band extras. Bands for other than cooorage purposes are 1.50c., base, half extras, as per Standard Steel card. Above prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery.

**Tin Plate.**—New business in Tin Plate has materially increased recently, and the American Sheet & Tin Plate Company is now operating more than 70 per cent. of its capacity, a larger amount than for some months. The outside mills are also operating a larger capacity, and some very good orders are being placed. With the scarcity and high prices of Tin Bars, it would seem that it will not be very long until an advance will be made in Tin Plate. We quote \$3.30 per base box, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days.

**Merchant Steel.**—The large trade which places contracts for delivery ahead, such as the implement and car builders, are specifying very freely on these contracts, and the mills are being pushed to their utmost to get out tonnage as fast as it is specified. The Crucible Steel Company will push sales of its products in foreign countries, and Alexander Thomas, secretary, is on his way to the Orient for the purpose of having branch offices opened and regular agencies established. The leading mills are well sold up for the next three months or longer, especially on Soft Steel products, on which some mills that can make reasonably prompt deliveries now ask premiums. On current tonnage we quote: Smooth Finished Tire, 1.70c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. The demand for Shafting is quite heavy, which we quote at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

**Spelter.**—The output of Spelter at present is exceedingly heavy, but the demand is equally as large and takes the output as fast as turned out. Ore has advanced again and prices of Spelter are very firm. We quote prime grades of Western Spelter at 6.05c. to 6.10c., St. Louis, equal to 6.17 $\frac{1}{2}$ c. and 6.22 $\frac{1}{2}$ c., Pittsburgh.

**Merchant Pipe.**—The mills have no complaints to make as regards tonnage, which is very heavy, but prices continue low, and to Pipe mills that have to buy Skelp are probably below actual cost of production. Some large oil lines are still being figured on, the largest of these being the Cudahy line for taking oil from Kansas City to St. Louis, and which if placed will require about 600 miles of 6-inch Pipe. The National Tube Company has recently shipped 25 miles of 6-inch Pipe for a water line in Mexico and the same quantity to Shreveport, La. Prices are very firm and some of the outside mills are strongly insistent that an advance in prices should be made. Discounts are as follows:

## Merchant Pipe.

	Jobbers, carloads.		Consumers, carloads.	
	Steel.	Iron.	Steel.	Iron.
	Blk. Galv.	Blk. Galv.	Blk. Galv.	Blk. Galv.
1/4 and 1/2 inch.....	72	56	69 1/2	53 1/2
3/4 and 1 inch.....	76	64	73 1/2	61 1/2
1 1/2 to 6 inches.....	80	70	78	68
7 to 12 inches.....	75	60	73	57 1/2
Extra strong, plain ends:				
1/4 to 3/4 inch.....	65	53	62 1/2	50 1/2
1/2 to 4 inches.....	72	60	69 1/2	57 1/2
4 1/2 to 8 inches.....	68	56	65 1/2	53 1/2
Double extra strong, plain ends:				
1/2 to 8 inches.....	61	50	58 1/2	47 1/2

**Boiler Tubes.**—The current demand continues heavy and the mills are sold up for the next three or four months and are somewhat behind on deliveries. The market is firm and reports of cutting in prices are strongly denied. Discounts are as follows:

## Boiler Tubes.

	Iron.	Steel.
1 to 1 1/4 inches.....	41	44
1 1/4 to 2 1/4 inches.....	41	56
2 1/4 inches.....	46	58
2 3/4 to 5 inches.....	53	64
6 to 13 inches.....	41	56

**Coke.**—We note a continued active demand for both Furnace and Foundry Coke, and on contracts for strictly Connellsville Furnace Coke \$2.90 to \$3 a ton has been paid in a number of cases. Strictly Connellsville 72-hour Foundry Coke for first half of next year commands \$3.50 a ton at oven. The movement of Coke is fairly satisfactory and as yet there has been no serious shortage in cars. The W. J. Rainey Coke Company will build two new plants of about 600 ovens each in the Connellsville region, but work will not start until next year. Output of Coke last week in the Upper and Lower Connellsville regions amounted to 366,439 tons.

**Iron and Steel Scrap.**—We note a continued active demand for nearly all kinds of Scrap, but dealers quote such high prices that consumers are holding off and are buying only such material as they actually need. Heavy Melting Scrap is scarce and is held at about \$17 to \$17.50, although reports are that \$18 has been done. Other grades of Scrap are very firm, dealers quoting as follows: No. 1 Wrought Scrap, \$16.50; Cast Iron Borings, \$9 to \$9.50; Bundled Sheet Scrap, \$14.25 to \$14.50; Old Steel Rails, short pieces, \$16; long pieces, \$16.50; Machinery Cast Scrap, \$15, and Cast Steel Scrap, \$15.50, all in gross tons, f.o.b. Pittsburgh.

G. A. Armstrong, formerly assistant secretary of the Pickands-Magee Coke Company, Uniontown, Pa., is now connected with the Pittsburgh office of Matthew Addy & Co., Farmers' Bank Building, Pittsburgh, dealers in Pig Iron, Steel, Ferromanganese, Scrap and Coke.

## Philadelphia.

REAL ESTATE TRUST BUILDING, October 7, 1905.

The Iron and Steel markets maintain a strong tone, with a very active demand for almost everything on the list. The chief interest is of course in Pig Iron, which is the foundation of the entire business. Buying is not as large as it was during last month and the month previous, but when furnaces have as much business on their books as they have now, taking on more is like the proverbial straw that broke the camel's back. A continuation of the demand even on a moderate scale could hardly fail to cause a further advance, although producers claim that prices are high enough; but all the same they quote higher figures and the iron is taken, so that, as Tweed said: "What are you going to do about it?" Taking an unbiased view of the situation, it looks as though \$20 for Pig Iron would be reached before the end of the year, and if buyers take the bit in their teeth it may go considerably higher. If it does, a readjustment will be necessary along the entire line. Pig Iron has advanced easily \$3 per ton, while finished products have hardly moved at all, so that further advances in raw materials must carry with them an advance in finished products commensurate with the increased cost of production. It is true that an enormous tonnage of Pig Iron was bought at prices much below those that are now ruling, but it is probable that an almost equal tonnage of finished material was sold against it. The purchases of Pig Iron, &c., at to-day's quotations therefore require a new list of prices for its products, and if (as many believe) we are going to have \$20 Iron, the need for readjustment will be still more imperative. It is, of course, not impossible that there may be an unexpected setback, but all the indications appear to be for better rather than for less favorable conditions. The European situation is fraught with danger, however, and in Wall Street the financial outlook is none too good, so that in spite of apparently unprecedented prosperity it will do no harm to have an anchor to windward. The feeling is intensely sanguine, however, and is no doubt amply warranted by the immediate conditions.

**Pig Iron.**—The feeling is very strong and prices average about 25c. higher than during the week previous. No. 2 X at \$17.75 is no longer available and it is doubtful if anything could be had at \$18, nearly all the sales during the past two or three days having been made at \$18.25, and even at that price sellers are not anxious for new business. There is considerable anxiety in regard to deliveries during the winter months and even now there is quite a scarcity of some grades, particularly such as are used for Steel making. The advance in the price of fuel and the difficulty in getting it promptly are other disturbing elements, all of which tend to conservatism in regard to further sales of Pig Iron. Certain it is that prices will go higher if buyers insist upon increasing their lines, but when the fever is on there is no saying where it will end. A large majority of the leading consumers have already covered for the first half of 1906, which should lead to a period of comparative quiet, but there are no signs of it as yet. Matters are in such shape, however, that almost anything might happen before the end of the year (except a decline in prices), so that it is hardly worth while to make guesses, although the odds appear to favor a dollar, and possible \$2 or \$3, rise before the close of the year. Sales of No. 2 X Foundry, as we said before, have been mostly on the basis of \$18.25, delivered, and Gray Forge at \$16.50. Basic has been sold in 5000-ton lots at \$17.50 for the first half of 1906, but \$17.75 is now said to be a minimum quotation. The lots last taken could hardly be regarded as new sales, as they had been under negotiation for several days and were on quotations made several days previous to their final acceptance. Nevertheless the last reported sales were at \$17.50, the present asking price being \$17.75. Malleable Iron is in good demand, with sales of good sized lots at \$18.75, and \$19 asked on further quantities in 1000-ton lots and upward. Low Phosphorus is scarce, with sales in 1000-ton lots at \$23.50 for nearby deliveries and still higher figures asked for this year's shipments. The general range of prices for Philadelphia and nearby points is about as follows:

No. 2 X Foundry.....	\$18.00 to \$18.25
No. 2 Plain.....	17.50 to 17.75
No. 2 Southern.....	17.75 to 18.00
Standard Gray Forge.....	16.25 to 16.50
Basic.....	17.50 to 17.75
Low Phosphorus.....	23.50 to 24.00

**Ferromanganese.**—The scarcity continues and it is more a question of favor than of prices that will secure any for this year's delivery. In such cases \$65 is quoted and about \$55 for shipments during the first half of 1906.

**Ferrosilicon.**—Prices are nominal, as last quoted: 11 per cent., \$29 to \$30; 50 per cent., \$95, and 75 per cent., \$170 to \$175.

**Steel.**—It is difficult to give quotations for this year's deliveries, but about \$30 would have to be paid, providing the article could be had at all. That figure might possibly be shaded a little for the first quarter of 1906, but the feeling is very strong and higher rather than lower quotations are probable in the near future.

**Muck Bars.**—No demand of any importance. Nominally prices are \$28.50 to \$29, delivered to nearby mills, but there is practically nothing doing.

**Plates.**—There is an excellent demand for Plates, and mills have a great many orders on their books, with liberal additions almost daily. The demand is of that widely diversified character that takes in almost every consuming interest, and indicates extremely favorable conditions in all departments. Prices are firm and unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.73 1/2	1.78 1/2
Flange or Boiler Steel.....	1.83 1/2	1.88 1/2
Marine, A. B. M. A. and Commercial		
Fire Box Steel.....	1.93 1/2	1.98 1/2
Still Bottom Steel.....	2.03 1/2	2.08 1/2
Locomotive Fire Box Steel.....	2.23 1/2	2.28 1/2
The above are base prices for 1/4-inch and heavier. The following extras apply:		
3-16-inch thick.....	\$0.10	pounds extra.
Nos. 7 and 8, B. W. G.....	.15	"
No. 9, B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"

**Structural Material.**—The same old story of a demand beyond what the mills can supply is about all that can be said. An attempt at a local strike has been made by some of the Structural workers, but it is not likely to amount to much beyond giving annoyance and causing more or less delay in work which would otherwise be well under way. Prices are nominally unchanged, but premiums have to be paid for quick deliveries. Official quotations are as follows: Beams and Channels up to 15 inches, 1.83 1/2c. to 2c., and a tenth more for large sizes and about the same schedule for Angles.

**Bars.**—Business is not rushing by any means, but when 1.83 1/2c. is quoted for next year's deliveries buyers are



easily found. Most of the mills want more money, however, and also strict guarantees that specifications will be sent in on definitely fixed dates. Steel Bars are officially quoted at 1.63½c., but there is no guarantee as to deliveries, which may be in 30 or 60 days, or may be well into next year, as may suit the convenience of the seller. Consequently premiums have to be paid for prompt deliveries.

**Sheets.**—A good demand at firm but unchanged prices, which are as follows: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

**Old Material.**—There is little or no change in prices, which, however, are very firm, Steel being probably a trifle dearer. The range for deliveries in buyers' yards is about as follows:

Choice Scrap, R. R. No. 1 Wrought.....	\$22.50 to \$23.00
No. 1 Yard Scrap.....	19.50 to 20.50
Long and Short.....	18.50 to 19.50
Machinery Scrap.....	16.00 to 16.50
Wrought Iron Pipe.....	16.50 to 17.00
No. 1 Forge Fire Scrap.....	16.00 to 16.25
No. 2 Light Ordinary.....	12.50 to 13.00
Wrought Turnings.....	14.00 to 14.50
Axle Turnings, Choice Heavy.....	15.00 to 15.50
Cast Borings.....	10.50 to 11.00
Stove Plates.....	13.00 to 13.50
Grate Bars.....	12.75 to 13.00
Scrap Steel Rails.....	18.00 to 18.50
No. 1 Steel Scrap.....	17.75 to 18.25
Low Phosphorus Scrap.....	22.00 to 22.50
Old Steel Axles.....	21.50 to 22.50
Old Iron Axles.....	27.50 to 28.00
Old Iron Rails.....	24.00 to 25.00
Old Car Wheels.....	17.00 to 17.50

Weston Donaldson, Iron and Steel Scrap merchant, has removed his offices to rooms 908 and 909 Arcade Building, Fifteenth and Market streets, Philadelphia.

## Cincinnati.

FIFTH AND MAIN STS., November 7, 1905.—(By Telegraph.)

**Pig Iron.**—The market conditions are still strong and the situation, viewed from all points, appears to be very satisfactory. Both Northern and Southern brands are stronger than at date of last week's report, with everything pointing to a still further advance. No. 2 Southern is apparently well established at \$14, Birmingham, with sales in small tonnage made at prices above and below this figure. Northern No. 2 is quotable at \$16.50 to \$17 at furnace, the market showing great strength and firmness. A small number of the furnaces in this section are holding for 50c. to 75c. higher than this figure, but are practically doing no business on this basis. Spot Iron, which in most instances can be bought at prices below schedule, is daily becoming less and less, and at this time there is but a small tonnage on hand. Gray Forge is showing more strength and activity and there are several fairly good inquiries in the market for this grade of Iron, which is quotable at \$12.50, Birmingham. The general foundry trade is fairly well covered, comparatively little new buying being done and taking contract Iron as received. Basic and Malleable continue to show considerable activity, a number of sales having been made and a number of inquiries still pending. One of the large Pipe industries is said to be buying on a large scale and, while not in the market for any specific tonnage, is nevertheless taking what offers, other things being equal. We note an inquiry from a consumer in northern Ohio for 2000 tons of Gray Forge, one from southern Indiana for 1000 tons and one from Chicago territory for about 2000 tons of the same grade. A sale of 4000 tons of Malleable was made to a Detroit consumer. Freight rates from Hanging Rock district to Cincinnati are \$1.15 and from Birmingham \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$17.00 to \$17.25
Southern Coke, No. 2.....	16.50 to 16.75
Southern Coke, No. 3.....	16.00 to 16.25
Southern Coke, No. 4.....	15.50 to 15.75
Southern Coke, No. 1 Soft.....	17.00 to 17.25
Southern Coke, No. 2 Soft.....	16.50 to 16.75
Southern Coke, Gray Forge.....	15.00 to 15.25
Southern Coke, Mottled.....	14.75 to 15.00
Ohio Silvery, No. 1 (8% Silicon).....	19.65 to 19.90
Lake Superior Coke, No. 1.....	18.15 to 18.65
Lake Superior Coke, No. 2.....	17.65 to 18.15
Lake Superior Coke, No. 3.....	17.15 to 17.65

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$19.25 to \$19.50
Lake Superior Car Wheel and Malleable.....	18.50 to 19.00

**Coke.**—This market continues very active and prices are holding firm. A number of very good sales have been made during the week running up into considerable tonnage for furnace and melters' purposes. The scarcity of cars is felt more each day and it appears almost impossible for operators to secure sufficient equipment to move contracts, thereby causing a decided scarcity for early shipment. Furnace grades are now firm at \$3 to \$3.50, and the best grades of Foundry of both Connellsville and Virginia regions are quotable from \$3.90 to \$4.10, f.o.b. ovens.

**Finished Iron and Steel.**—There is apparently no change in the situation and the outlook is very bright.

Structural Shapes are in active demand and considerable new business is being offered. Prices remain unchanged. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

**Old Material.**—Prices are a shade higher and the market is strong and very firm. The rolling mill demand is on the increase and considerable trade has resulted from this source. We quote dealers prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$17 to \$17.50 per net ton; No. 1 Cast Scrap, \$14 to \$14.50 per net ton; Iron Rails, \$20 to \$21 per gross ton; Steel Rails, rolling mill lengths, \$15 to \$15.50 per gross ton; Relaying Rails, 56-lb. and upward, \$24.50 to \$25 per gross ton; Iron Axles, \$22.50 to \$23 per net ton; Car Wheels, \$16.50 to \$17 per gross ton; Heavy Melting Scrap, \$15 to \$15.50 per gross ton; Low Phosphorus Scrap, \$18.50 to \$19 per gross ton.

A receiver has been appointed by the United States Court for the Field Evans Iron Company, the purpose being to settle the differences of opinion existing between the stockholders. All debts have been paid and all contracts completed.

W. H. D. Totten, Jr., formerly local manager for the Carnegie Steel Company, Cincinnati, Ohio, has embarked in business for himself, with headquarters in the Union Trust Building, Fourth and Walnut streets. He will handle the same classes of materials as for the company which he has been representing.

## Birmingham.

BIRMINGHAM, ALA., November 6, 1905.

**Pig Iron.**—The market is very firm at \$14 for No. 2 Foundry. No large contracts have been reported this week, but numerous small ones have been made, mostly for delivery first and second quarters next year. A few sales of spot Iron, where immediate delivery was required, are reported at a slight advance over the above price, but as a general thing buying has been confined to future delivery. At least two of the smaller furnace companies are out of the market for the first quarter of next year, and several of the larger ones have attempted to call in the quotations now in the hands of their agents, but without success until pretty well loaded up, so they state. The operators are all very optimistic in their views, and while they are not turning down their regular customers for their requirements for the first quarter of next year, they are not exerting themselves to sell at present prices. Several of the yards seem well stocked with Iron, but the operators claim this has all been sold, and are only waiting shipping instructions to clean up their yards. This would seem to indicate the Iron might have been sold to speculators rather than to consumers. Scarcity of cars has retarded the Iron movement to a considerable extent, but this is gradually easing up and the railroads promise better transportation facilities in future. More Iron was shipped out of Birmingham last week, it is reported, than for any week in several months. Several furnaces now out of blast for repairs will start up about January 1, but as the operators have not announced whether others will be blown out as soon as these are back in operation, it cannot be definitely said if this will increase the present output.

The Tennessee Company's Steel mill at Ensley reports a production of 25,000 tons last month, the largest in its history. The greater portion of this was consumed in the company's own Rail mill. Rumor is again rife to the effect that the Sloss Company will erect a Steel plant at North Birmingham and the Republic Company one at Thomas in the near future, but confirmation is lacking from officials in position to know.

The American Cast Iron Pipe Company broke ground last week for its plant at North Birmingham, and expects to be in operation by April 1, 1906. It is starting with three pits, making from 4 to 30 inch Pipe, with an annual output of about 75,000 tons. The other Pipe plants in this district report plenty of orders at satisfactory prices.

The Birmingham district's greatest need at the present time is labor; in fact that is the most serious problem now confronting it. Thousands of Italians, Poles and Swedes have been brought here by the large corporations and there is still plenty of work for many thousands more. The sentiment against importing this foreign labor is fast dying, and every one now realizes the importance of securing immigrants for work in the mines and furnaces, as in their operation largely depends the prosperity of the district.



## Cleveland.

CLEVELAND, OHIO, November 7, 1905.

**Iron Ore.**—One of the occasions for the lessening of the Ore shipments down the lakes during October was the fact that the tonnage was so strongly in demand in other quarters that higher rates had to be paid on wild cargoes. The shippers by preference chose to rely principally upon contract boats. In addition, boats have been delayed at unloading docks by a car shortage and a congestion at the docks. Some delays have also been occasioned by the necessity of steaming the Ore in the pockets at the upper lake ports. Shipments of Ore down the lakes during October amounted to 4,257,009 tons, against 4,034,721 for the corresponding month a year ago, the increase being 222,228 tons. The shipments to November 1 this year amounted to 29,730,615, against 17,657,159 for the corresponding period a year ago. The increase is 12,073,456 tons. The best total for any one year up to this time was 27,500,000, which was in 1903.

**Pig Iron.**—There is less talk of high prices on Foundry Iron. Some furnaces still report a few sales for spot shipment as high as \$17 in the Valleys for No. 2, but in the main the price for all deliveries holds at \$16.50 in the Valleys. It is evident that buying for the present is comparatively light. Most of those intending to contract for the remainder of this year or the first quarter of next have done so. The larger consumers who care to contract through the first half of next year have also covered the greater part of their needs. There is little occasion, therefore, for heavy buying at present. Steel making Irons are stronger. In some instances Basic is reported to have been in such demand for prompt shipment that as high as \$17 has been paid. In the main the price holds at \$16.50 to \$16.75 in the valleys for Basic and Bessemer. The Coke market is stronger. The supply seems to be short principally because railroad equipment is at a premium. The best grades of 72-hour Foundry Coke are quoted at \$4. The best grades of Furnace Coke are quoted at \$3.25 to \$3.75 at the oven.

**Finished Iron and Steel.**—With many of the larger mills being in position to make deliveries on Plates in three to four months, some being even in better shape, premiums do not seem to be popular. Some of the smaller mills in the East selling in this territory are able to command \$2 to \$3 premium for quick shipment. No contracts are taken on that basis. A new era of shipbuilding seems to have opened on the lakes, making demands for larger amounts of Steel. Two boats recently ordered will not be ready for the opening of the season of navigation and mills have more time in which to make deliveries. These boats have been in contemplation for some time and it is understood that the old contracts for Steel are elastic enough to cover the new orders, the intervening advance in the price of Shapes having little effect in that quarter. The demand for Structural Steel is steady, with no signs of abatement. In some instances jobbers are selling Shapes as high as 3c., but this is only on small lots of certain sizes which are scarce. The ruling price from the jobbers is 2.50c. The situation is exceedingly strong, specifications against old contracts being so good there is little likelihood of any easier tone to the market for some time. The Eastern mills which have been supplying urgent needs for quick shipment in this territory have recently been able to make short time contracts on a premium basis. The Bar Iron market is unusually strong. Some good contracts have recently been made running through this year and the first quarter of next on the basis of 1.75c., Youngstown, while some contracts have entailed deliveries through the first half of next year on the same basis. In a number of instances Bar Iron for spot shipment has sold at 1.80c., Youngstown. Steel Bars continue in fair demand, but there is no particular rush. Some of the larger mills are in position where they can make quick shipments. Specifications against old contracts are up to contract requirements. The price holds at 1.50c., Pittsburgh, for both Bessemer and Open Hearth. The Pipe market is a little stronger, although not as yet robust. On Steel Pipe the quotation ranges close to the association figure of 80 and 5 off list, although that is shaded in some instances. For Iron Pipe the market is represented by the association quotation of 77½ off list for the full weight. Sheets have been steady. Most of the business is done out of stock, on which quotations have not been changed, being based on 2.05c. for No. 10 Blue Annealed, 2.55c. for No. 28 One Pass Cold Rolled and 3.55c. for No. 28 Galvanized.

**Old Material.**—The market for Scrap might be called strong. Buying has been liberal for spot shipment and there is a good demand for material on contracts. At the same time it is noticed that a good many of the mills are well bought up for the immediate future, and dealers are forced to put a check on material seeking a market. The prices are revised and quoted as follows, being dealers' quotations to the trade, gross tons: Old Steel Rails, \$16 to \$16.50; Old Iron Rails, \$23 to \$24; Iron Car Wheels, \$16 to \$16.50; Heavy Melting Steel, \$16.50 to \$17. Net tons: Cast Borings, \$9.50 to \$10; No. 1 Busheling, \$15;

No. 1 Railroad Wrought, \$16.50 to \$17; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$14.50 to \$15; Stove Plate, \$11; Iron and Steel Turnings and Drillings, \$11.

## New York.

NEW YORK, November 8, 1905.

**Pig Iron.**—The market in this immediate district has been fairly active and very strong. There has been heavy buying of Forge, Malleable, Bessemer and Foundry Iron in the Albany district and in western New York, and there are in the market some large inquiries from the South. We quote for Northern, tidewater, \$18.50 to \$18.75 for No. 1 Foundry, \$17.75 to \$18.50 for No. 2 Foundry and \$17.25 to \$17.50 for No. 2 Plain. Southern Iron is selling on the basis of \$17.75 to \$18 for No. 2 Foundry, New York harbor.

**Steel Rails.**—There has been a good run of business in scattering lots for steam roads in the past week. The more noteworthy contracts are the following: 10,000 tons additional for the St. Paul, making its total about 70,000 tons; 11,000 tons additional for Reading, 9000 tons for the Detroit & Bay City traction line; 8500 tons for the Pittsburgh & Lake Erie, 5000 tons for the Chicago, Desplaines & Fox River, 4000 tons for the Grand Rapids & Indiana, 3000 tons for the El Paso & Southwestern and 2000 tons additional for the Chesapeake & Ohio.

**Structural Material.**—A goodly amount of railroad bridge work is pending, including one contract for 30,000 tons, which is likely to be closed soon. The local building trade shows no large new business, but the American Bridge Company has closed considerable work throughout the country, including 7500 tons for a new bank in Chicago and 7500 tons for an addition to the Carson, Pirie & Scott store on State street, Chicago. Structural mills are filled for many months on wide Shapes, while 60 to 90 days is the best delivery that can be made on any sizes. We quote the following minimum prices for tidewater delivery on mill shipments: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams 18 to 24 inches, 0.10c. extra; Angles over 6 inches, 0.10c. extra. Sales of Structural Steel out of stock have been made at 2.25c. to 2.75c.

**Plates.**—Mill representatives find orders for small lots coming along quite freely. No large transactions are reported, but not much business of such a character is expected at present as the heavy buyers are well covered for the remainder of the year. Prices are firmly held. Quotations, at tidewater, for shipment from mills, are as follows: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 1.94½c. to 2.04½c.; Fire Box Plates, 2.04½c. to 2.60c., according to specifications.

**Bars.**—The situation continues very strong, the demand being active and the mills becoming still more closely sold up. Bar Iron is quoted at 1.79½c. to 1.84½c., tidewater, and Steel Bars nominally at 1.64½c., tidewater. Early deliveries of Steel Bars cannot be had at anything like this price.

**Cast Iron Pipe.**—Considerable interest is taken in the letting by New York City of 7800 tons of 48 and 60 inch Pipe, which is to occur to-day. The general demand continues extraordinarily strong for the lateness of the season. The active demand for quick shipments of small sizes is unabated. Carload lots continue to be quoted at \$27.50 per net ton for 6-inch, at tidewater for future delivery.

**Old Material.**—The demand for Steel Scrap is urgent. While rumors are current of some large sales, most holders of this class of material expect higher prices and are not willing to part with much of their stock at the offers now being made. It is definitely known, however, that one sale of 2000 tons of Steel Scrap was made at \$18, delivered eastern Pennsylvania. Cast Scrap is particularly strong, in sympathy with the higher prices prevailing on Pig Iron. A sale is reported of 1000 tons. Stove Plate has also improved and would probably bring 25c. per ton more than last week. Among other transactions which have been closed by local merchants are 500 tons of No. 1 Railroad Wrought at \$22.75, eastern Pennsylvania; 500 tons of Wrought Pipe, 500 tons of Borings and 500 tons of Turnings. Borings and Turnings are notably stronger than during the past two or three weeks. Quotations are approximately as follows for New York and vicinity per gross ton:

Old Iron Rails.....	\$22.00 to \$22.50
Relaying Rails.....	24.50 to 25.00
Old Steel Rails, rerolling lengths.....	16.50 to 17.00
Old Steel Rails, short pieces.....	16.25 to 16.50
Heavy Melting Steel Scrap.....	16.25 to 16.50
Standard Hammered Iron Car Axles.....	25.00 to 26.00
Old Steel Car Axles.....	21.00 to 22.00
No. 1 Railroad Wrought.....	21.25 to 21.50
Iron Track Scrap.....	18.50 to 19.25
No. 1 Yard Wrought, long.....	19.00 to 19.75
No. 1 Yard Wrought, short.....	17.00 to 17.75
Wrought Pipe.....	15.25 to 15.50
Light Iron.....	11.50 to 12.00
Cast Borings.....	9.25 to 9.50
Wrought Turnings.....	13.00 to 13.50
Old Car Wheels.....	17.25 to 17.75
No. 1 Machinery Cast.....	14.75 to 15.75
Stove Plate.....	11.75 to 12.75
Malleable Cast.....	15.25 to 16.25

The late Perth Amboy Shipbuilding & Engineering Company, Perth Amboy, N. J., had on hand when operations ceased about 600 tons of Plates and Shapes. This material has now been sold through Charles Hubbard & Co., New York, the entire stock going to one consumer.

## Metal Market.

NEW YORK, November 8, 1905.

**Pig Tin.**—The local market has advanced slightly from day to day due to minor advances in London as well as the shortness of available supplies in this market. Business has been dull, consumers evidently holding off until additional supplies arrive from the other side. The premium that spot stocks command above London parity is not as large as was anticipated, some holders of the metal evidently being contented with a slight profit. The statistics so far this month are favorable from the seller's point of view. But 780 tons of metal have arrived from the other side, and there are 1900 tons afloat. Little of this metal, however, will be available before the unloading of the Minnetonka, which will probably take place on the 16th. Some small lots have arrived on direct steamers from the Far East, but it will probably take some time to unload the metal from these steamers. Today's market in London is slightly higher at £150 7s. 6d. for spot and £149 15s. for futures. Spot stocks in New York are quotable at 33.20c.

**Copper.**—There has been little activity in the export market the past week, a total of 3150 tons having been exported so far this month. Local business was also very dull, consumers being apparently well stocked with the metal for immediate needs. Both Lake and Electrolytic are sold at 16.50c., delivered in the Connecticut Valley in 30 days. Spot stocks command a premium, varying according to the brand and delivery. Casting grades are now held at 16.25c. The London market is firm at £73 5s. for spot and £71 10s. for futures, a sharp advance since yesterday. Best Selected is quoted at £77 10s. Some shipments to the Orient are being made on old contracts.

**Spelter.**—The market is easy, both St. Louis and New York quotations having declined during the week. Buyers are holding off, except for small lots, and 6c. is quoted in St. Louis and 6.10c. to 6.20c. New York. The export movement has been very slight. In London the market is higher at £28 7s. 6d. and business is not quite as active as a few weeks ago.

**Pig Lead.**—Considerable premiums have been obtained for strictly spot stocks. One carload sold by three jobbers went at ½c. premium above the market. This is an exceptional case, but illustrates the scarcity of spot metal. On the New York Metal Exchange Lead is quoted at 5.25c. to 5.35c., New York. In St. Louis 5.10c. is asked. The London market has also again advanced to £15 2s. 6d.

**Antimony.**—There is very little business, and prices are unchanged at 12.50c. to 13c. for Cookson's; 12c. to 12.50c. for Hallett's and 11.50c. to 12.25c. for other brands.

**Nickel.**—There is a fair demand for the metal at the old price of 40c. to 45c. for large lots, and 50c. to 55c. for smaller quantities.

**Quicksilver.**—The old price of \$40 per flask for flasks of 75 lbs. in 100-flask lots continues. In San Francisco domestic orders are held on the basis of \$39. The price of Rothschild's as well as second-hands in London is unchanged at £7 2s. 6d.

**Tin Plate.**—The booking of orders at the mills continues in fair volume. The principal producer continues to quote 100-lb. IC Coke Plates on the basis of \$3.49, f.o.b. New York, and \$3.30, f.o.b. Pittsburgh. In New York jobbers have reduced the price of Tin Plate from store 10c. per box. In Swansea Welsh plates are unchanged at 12s. 9d.

## Iron and Industrial Stocks.

NEW YORK, November 8, 1905.

The past week has been marked by some important fluctuations in iron and steel stocks, largely influenced by the course of the money market. A decline occurred from Thursday which showed its extreme depth on Saturday, at which time the most active stocks were from \$1 to \$3 per share under the highest Thursday prices. On Monday a sharp advance took place, which brought back stocks to the level of Thursday. In one instance, however, a new high record was made, this being in the case of Railway Spring common, which advanced to 57½. Last transactions up to 1.30 p.m. to-day, when the market was again under pressure, are reported at the following prices: Can common 10, preferred 70¼; Car & Foundry common 40½, preferred 100; Locomotive common 70, preferred 114¼; Steel Foundries common 12½, preferred 45½; Colorado Fuel 44¼; Pressed Steel common 51, preferred 99½; Railway Spring common 55½; Republic common 25¼, preferred 94½; Sloss-Sheffield com-

mon 70½; Tennessee Coal 93½; United States Cast Pipe common 40½, preferred 95; United States Steel common 37¼, preferred 103¼.

Stockholders of the Westinghouse Machine Company, East Pittsburgh, will vote on December 23 on a proposition to increase the capital stock from \$5,000,000 to \$10,000,000, to enable the company to take care of its growing business in the manufacture of steam turbines and gas engines. The increase of \$5,000,000 in the capital stock of this company will bring the total capital of the Westinghouse Companies in the Pittsburgh district and abroad to nearly \$100,000,000. It is stated that these companies give employment to approximately 30,000 men.

The General Electric Company, Schenectady, N. Y., will hold a special meeting December 5 for the purpose of considering a proposition to authorize the issue of \$11,674,500 new stock, which will increase its capital stock to \$60,000,000.

**Dividends.**—Niles-Bement-Pond Company has declared a quarterly dividend of 1½ per cent. on preferred stock, payable November 15.

Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 15.

Truss Steel Tie Company, Pittsburgh, Pa., has declared a dividend of 10 per cent. in the shape of a distribution of stock of the National Cast Steel Company, Avonmore, Pa., which was recently acquired by the Truss Steel Tie Company.

## New York Pig Iron Warrant Market.

The sale of pig iron warrants and pig iron warrant certificates in the pig warrant market in the Produce Exchange during the week ending at noon Wednesday amounted to 2000 tons. The transfer as recorded is as follows: 200 tons cash regular, \$17; 100 tons December regular, \$17; 100 tons January regular, \$17; 300 tons February regular, \$17; 300 tons February foundry, \$17; 200 tons January foundry, \$16.90; 100 tons No. 2 Alabama December, \$13.65; 100 tons Alabama January, \$11.90; 500 tons No. 2 Alabama February, \$13.75; 100 tons Alabama No. 2, \$14. The following prices were established on call Wednesday noon:

Cash	Regular		Foundry	
	Bid.	Asked.	Bid.	Asked.
November	16.85	.....	17.00	.....
December	16.85	.....	17.10	.....
January	17.10	.....	17.20	.....
February	17.30	.....	17.45	.....
March	.....	.....	.....	.....

## La Belle Iron Works Options.

Edwin N. Ohl, vice-president of the Cherry Valley Iron Company, Pittsburgh, has recently sent out letters to the stockholders of the La Belle Iron Works, Steubenville, Ohio, of which there is about 600, asking for options on their stock on a two to one basis, or \$200 a share, these options to run from December 1 to March 1. The offer is made that in case the options are not exercised prior to January 1 the price is to be \$201 per share, if not taken prior to February 1 the price is to be \$202 a share and if not taken prior to March 1 \$203 a share. In addition, present holders of the stock are to participate in the next quarterly dividend of 1½ per cent., to be paid February 1, if their stock is not transferred prior to January 20, on which date the transfer books close. A number of the leading stockholders of the La Belle Iron Works are connected with Mr. Ohl in his plan to secure control of the company, and there is every probability that they will secure the property on the above terms. Their plans have not been made public and will not be for some little time. It can be stated officially that neither John W. Gates nor Charles S. Guthrie of the Republic Iron & Steel Company is connected in any way with the project.

The La Belle Iron Works has a very modern plant at Steubenville, comprising two large blast furnaces, an open hearth steel plant having nine 50-ton furnaces, and skelp, pipe and plate mills. An 84-inch plate mill has been recently added to the plant. The company also has a large cut nail factory. In addition it owns the Pittsburgh Mining Company and has coal and coke properties and is self contained in every way. Its capital is \$7,000,000 and in addition it has issued \$2,500,000 worth of bonds which bear 6 per cent. annual interest. The stock has been paying quarterly dividends of 1½ per cent.



Railroads of the United States in 1904.

Advance sheets of Poor's Manual for 1905 give instructive statistics on the operations of the railroads of the United States in 1904, with comparisons for a series of years as to mileage, equipment, capital, earnings, rates, &c. The length of railroads completed December 31, 1904, was 212,348.72 miles, of which reports of traffic statistics, earnings, &c. (complete returns), were received from 206,482.37 miles, and of gross earnings, but not traffic operations from 974.41 miles. The total not reporting operations was 3617.61 miles; total completed since the close of their fiscal years, 1274.33 miles. The net increase of mileage of all railroads in the United States in the calendar year 1904 was 5013.87 miles. The table below summarizes some of the important information in the volume. Figures for 1903 are omitted below, every item for 1904 showing an increase over that year. The statistics cover a period of eight years. We present below the statistics for 1904 and a comparison with 1897, the first of the eight years included in the tables:

General Exhibit of Operations and Capital.

	1904. Miles.	1897. Miles.
Mileage of railroads.....	211,074.39	183,547.07
Second track, sidings, &c.....	82,863.03	58,153.69
Total track.....	293,937.42	241,700.76
Steel rails in track.....	282,229.35	215,657.83
Iron rails in track.....	11,708.07	26,042.93
Number.		
Locomotives.....	48,658	36,410
Cars—Passenger.....	31,034	25,654
Baggage, mail, &c.....	10,947	8,180
Freight.....	1,728,903	1,234,972
Total revenue cars.....	1,770,884	1,268,806
Liabilities—		
Capital stock.....	\$6,447,045.374	\$5,602,964.449
Bonded debt.....	7,475,840.203	5,534,432.492
Unfunded debt.....	172,619.537	380,669.705
Current accounts.....	516,404.178	397,928.861
Sinking and other funds.....	190,213.456	*
Total liabilities.....	\$14,802,122.748	\$11,915,995.507
Excess of assets.....	620,750.567	307,793.194
Total assets.....	\$15,422,873.315	\$12,223,788.701
Passengers carried.....	716,244.858	504,106.525
Passenger mileage.....	22,174,139.991	12,494,958.000
Tons freight moved.....	1,277,771.573	788,385.448
Freight mileage.....	173,628,034.040	97,842,569.150
Traffic earnings—Passenger.....	\$456,342.380	\$253,557.936
Freight.....	1,374,102.275	780,351.939
Miscellaneous.....	147,194.058	98,956.751
Totals.....	\$1,977,638.713	\$1,132,866.626
Net earnings.....	639,240.027	342,792.030
Other receipts.....	81,357.891	97,631.314
Total available revenue.....	\$720,597.918	\$440,423.344
Payments—		
Interest on bonds.....	242,992.755	234,454.578
Other interest.....	13,651.590	5,776.727
Dividends on stock.....	188,386.093	83,680.040
Miscellaneous.....	54,557.670	29,123.068
Rentals—Interest.....	32,807.445	59,525.937
Dividends.....	23,136.073	
Miscellaneous.....	18,120.396	
Taxes.....	54,325.856	
Total payments.....	\$627,977.878	\$412,560.350
Surplus.....	92,620.020	27,862.994

\* Previous to 1899, included with profit and loss.

The mileage of iron rails in track has fallen over 50 per cent. since 1897, or from 26,043 to 11,708 miles. In locomotives there has been an increase of 33 per cent. over the total of 36,410 eight years ago, and in freight cars an increase of 40 per cent., or from 1,234,972 to 1,728,903. The increase in ton-miles of freight moved is noteworthy, from 788,385,448 in 1897 to 1,277,771,573 in 1904. The average haul has greatly increased, moreover, the total freight mileage last year being 173,628,340,040, as compared with 97,842,569,150 in 1897.

Ton Mile Rates and Net Earnings.

Of value in its bearing upon the present discussion of railroad rates is a table giving rates, both freight and passenger, per ton and per passenger respectively, and

gross and net earnings per mile of railroad operated, for a period of 22 years:

	Per ton per mile, average rate. Cents.	Per passenger per mile, average rate. Cents.	Earnings per mile of railroad in operation. Gross. \$	Net. \$	Percentage of expenses to earnings.
1883.....	1.224	2.422	7,405	2,679	63.82
1884.....	1.124	2.356	6,663	2,318	65.22
1885.....	1.057	2.199	6,209	2,163	65.17
1886.....	1.042	2.194	6,570	2,376	63.83
1887.....	1.034	2.276	6,799	2,418	64.44
1888.....	0.977	2.246	6,540	2,045	68.72
1889.....	0.970	2.169	6,446	2,066	67.95
1890.....	0.927	2.174	6,875	2,166	68.50
1891.....	0.929	2.184	6,851	2,135	68.83
1892.....	0.941	2.168	6,852	2,068	69.82
1893.....	0.893	2.072	6,963	2,069	70.29
1894.....	0.864	2.025	6,054	1,803	70.22
1895.....	0.839	2.069	6,097	1,804	70.41
1896.....	0.821	2.032	6,223	1,840	70.43
1897.....	0.797	2.029	6,228	1,884	69.74
1898.....	0.758	1.994	6,771	2,111	68.16
1899.....	0.726	2.002	7,161	2,272	68.27
1900.....	0.746	2.031	7,826	2,519	68.93
1901.....	0.756	2.028	8,270	2,668	67.73
1902.....	0.764	2.012	8,696	2,830	67.45
1903.....	0.781	2.052	9,301	2,887	68.96
1904.....	0.787	2.053	9,248	2,989	67.68

The return on bonds and stocks has shown a decrease in the former and an increase in the latter. In 1883 the average interest rate on bonds was 4.94 per cent. and the average dividend rate on stocks 2.76 per cent. In 1885 the averages were 4.95 and 2 per cent., respectively; in 1892, 4.25 and 1.93 per cent.; in 1894, 4.19 and 1.66 per cent.; in 1897, 4.24 and 1.51 per cent.; in 1900, 4.27 and 2.44 per cent.; in 1902, 4.10 and 2.97 per cent.; in 1903, 4.17 and 3.03 per cent., and in 1904, 4 and 3.31 per cent. Average dividend rates have thus been doubled since the low point reached in the years of depression following 1893.

Increase in Bonds and in Cost of Operation.

The growth in the bonded indebtedness of the railroads of the United States in recent years is sometimes held up as an unfavorable aspect of railroad finance. The statistics show that while stocks increased but \$845,000,000 from 1897 to 1904, bonds increased \$1,941,000,000, or from \$5,534,432,492 to \$7,475,840,203—an increase of 15 per cent. in stock and of 28 per cent. in bonds. The increase in bonds in a single year, from 1903 to 1904, was \$753,000,000, while the increase in stocks in the same time was but \$92,000,000. However, the excess of assets over liabilities, which was \$307,793,194 in 1897, was \$620,750,567 in 1904.

The increase in operating expenses in the past seven years is shown in a marked way by the statistics. The average gross earnings per mile in 1897 were \$6228, while the net earnings were but \$1884. In 1904 the average gross earnings were \$9248, and the net earnings \$2,989, per mile operated. Thus, increase in operating expenses absorbed about \$1900 of the \$3000 increase in net earnings, leaving \$1100 increase for the stockholders in dividends and in credits to surplus. A large part of the increase in expense was due naturally to the increase in the volume of business, but any comparison with 1897 would represent an increase for 1904, both in wages and cost of equipment and materials. The statistics for 1905 may be expected to accent this last item, as compared with 1904, since the latter was a year of very limited buying.

The Lidgerwood Mfg. Company has removed its Seattle branch office from the Lumber Exchange Building to the new Alaska Building. This is credited with being the finest office building in the Northwest, and the new location will afford every convenience for transacting the business of the company in the most expeditious and satisfactory manner.

According to figures given before the New England Cotton Manufacturers' Association it is estimated that there are 175 electrically operated textile mills in this country, using 140,000 horse-power. Estimating that the 1,165,000 horse-power used in 1900 in all textile mills in the United States has now become 1,400,000, it is seen that 10 per cent. of the power is now supplied electrically.



## The Machinery Trade.

NEW YORK, November 8, 1905.

Despite the fact that Election Day broke up the week's business to an extent machinery houses were well satisfied with the volume of business done. While there is nothing unusual in the way of lists on the market a large amount of running business is being transacted. Bearing out the statement made in these columns a few weeks ago to the effect that the demand for cranes was very heavy, those in that line declare that never before were there so many inquiries in the market. Cranes are coming into use in large establishments more and more, and as a result the specifications for crane requirements now before the trade are numerous and substantial. There seems to be a disposition on the part of some who have inquiries out to delay closing contracts and it is thought that some of the orders will not be given until the beginning of the new year. Attention of machinery men is centered upon the Degnon Contracting Company, which is buying for the Steinway tunnel project mentioned below. Railroads are among the customers who are keeping up the trade in general buying and many projects for factory extensions give promise of a good business in the future.

The Niles-Bement-Pond Company, New York, announces an advance in prices on all tools of from 5 to 7 per cent.

### Steinway Tunnel Requirements.

The Degnon Contracting Company, New York, which has been awarded the contract for constructing the Steinway tunnel, is purchasing considerable machinery in the market just now and will probably continue to do so for some time to come. The tunnel in question is to be constructed under the East River and will provide an entrance into New York for surface railway systems on Long Island controlled by the Belmont interests. The work of constructing the tunnel has progressed far more rapidly than has been generally known in the trade. Four shafts have been sunk and actual tunnelling operations commenced. The company has placed contracts for shields with the Logan Iron & Steel Company and, as was stated in *The Iron Age* last week, the contract for castings has also been given. The Watson-Stillman Company has secured some contracts for pumping machinery and there remains a number of substantial contracts to be awarded. The engineers in charge expect to tunnel through a considerable area of rock and on that account the amount of castings to be used will hardly be as large as that used on the Hudson River tunnels. The company will need a large quantity of rock drills, however, and will probably place orders for those machines right along for some time to come. An office has been opened at 218 East Forty-second street, adjacent to two of the shafts, one of which has been sunk near the ferry at the foot of East Thirty-second street and another further inland. R. A. Shaller is in charge of the operations and he is also doing most of the buying. It will be remembered that a vast amount of machinery and supplies were used on each of the Hudson River tunnels and the construction of the Steinway tunnel will entail similar heavy purchases. Although a number of substantial contracts, as stated, have been made, it is understood that the company will shortly purchase considerable machinery in the way of hydraulic appliances, consisting of hydraulic jacks, cylinders, valves and other appurtenances, and machinery men hereabouts will in all probability follow the company's movements closely for some time to come.

The Degnon Contracting Company has purchased 23 lots, comprising the entire block on the north side of Hunters Point avenue, bounded on the other sides by Davis street on the west, Crane street on the east and Meadows street on the north in Long Island City. The property has been bought in the interest of the New York & Long Island Railroad Company, which was organized to build the tunnel, and it is understood that it will be used for a car yard and probably for power house purposes. No contracts have been let for power house equipment as yet.

The Canadian Rand Drill Company has purchased 15 acres of land adjoining its plant at Sherbrooke, Quebec, to be used for the extension of its works there. No plans have been prepared as yet for the proposed extension, which is to be a large one, but it is understood that work will be begun shortly, as the company is rushed with orders and its plant is being operated to its full capacity. The Canadian Rand Company is the Canadian branch of the Ingersoll-Rand Company, 11 Broadway, New York. No factory changes have been made locally as a result of the recent union of the Ingersoll-Sergeant and Rand companies, but it is admitted that if the corporation intends carrying out its project of applying some Rand devices to Ingersoll-Sergeant products and *vice versa* there will have to be some extensions and changes at some of the plants before long.

In the Connellsville region of Pennsylvania a great many of the coal producers have been modernizing their plants and large quantities of coal conveying and handling machinery are being put in. Plans are under way for the in-

stallation of additional machinery at other mines and the demand in that territory is at present especially heavy. There will shortly be purchased by the W. C. Rainey interests, whose headquarters are at Connellsville, Pa., the necessary equipment for opening a large coal mine, but as only the shaft will be sunk this winter the larger portion of the machinery that will be required will not likely be purchased until the early spring. These large coal producers have purchased 1300 acres of coal land in the central part of the Connellsville region and besides the development of a large mine will erect a coke plant of 1000 ovens. Later it is the intention to build other coke ovens in that territory.

The Curtin-Ruggles Company, 39 Cortlandt street, New York, has been awarded a contract to construct and equip a 500-barrel slag cement plant for the Niagara Cement Company at Buffalo, N. Y., adjacent to the plant of the Buffalo-Union Blast Furnace. It is understood that the work is to be rushed through in order that the plant will be producing to compete for the spring trade. A 500 horsepower steam plant will be installed and equipped with Hamilton-Corliss engines made by the Hoovens-Owen-Rentschler Company and water tube boilers made by the Atlas Engineering Company, Indianapolis, Ind. The dryers will be furnished by the Ruggles-Coles Engineering Company and the mills by F. L. Schmidt of 39 Cortlandt street. Curtin-Ruggles Company is in the market for conveying machinery, power transmission machinery and other appliances and accessories. A 300-barrel cement plant is being constructed by the Curtin-Ruggles Company at Monterey, Mexico, for the Compania Fundidora de Fierro y Acero. A 250 horsepower plant, with horizontal tubular boilers, will be furnished by the Hoovens-Owen-Rentschler Company, and Ruggles-Coles dryers will be used and Allis-Chalmers tube mills. For this plant also the Curtin-Ruggles Company is in the market for conveying machinery, power transmission machinery and appurtenances.

The Central Mfg. Company, Connersville, Ind., will rebuild its plant, which was recently destroyed by fire, and is now in the market for a full line of wood working machinery adapted for the manufacture of carriage and automobile bodies.

The Fawcus Machine Company, Pittsburgh, Pa., which is to erect another addition to its plant, has arranged for all of the machinery for equipping the new building, with the exception of an electric traveling crane, which it expects to purchase in the near future.

On account of the large increase of business the Independent Pneumatic Tool Company, Chicago, whose Eastern office is at 170 Broadway, New York, intends to enlarge its plant at Aurora, Ill., and is now purchasing a large amount of machinery for equipping the new addition. During the month of October the company received an unprecedented number of orders for its Thor pneumatic tools and appliances, one cable order having been received from England for 200 piston air drills, reversible wooden boring machines, pneumatic riveters and chipping hammers of various sizes. The company reports a large demand for pneumatic tools from railroads and industrial works in this country.

The recent incorporation of the New Jersey Terminal Dock & Improvement Company at Trenton brought to light the plans formulated by the Hudson Street Railway Company and the Hudson companies to operate trolley lines in Hudson County, N. J., and erect a large power house and car sheds on the Hackensack meadows. The New Jersey Terminal Dock & Improvement Company controls the majority of the stock of the Hackensack Meadows Company, which owns the large tract of land on the meadows extending from Harrison to the west bank of the Hackensack River, opposite Jersey City. While no announcement has been made as to the company's plans as yet, it is admitted that the land will in all probability be used as a location for a power house to supply motive power for an extensive system of trolley lines to be operated throughout Hudson County and to connect with the tunnels of the Hudson Companies. The latter corporation is closely allied with the interests of the New Jersey Terminal Dock & Improvement Company and it is understood will compete with the Public Service Corporation for Hudson County traffic. No plans have been prepared as yet for the power house needed to operate the lines which the company has declared its intention of building and it is probable those details will not be taken up until the tunnels are completed. The New Jersey Terminal Dock & Improvement Company is capitalized at \$3,000,000 under a New Jersey charter and is authorized to issue \$3,000,000 in bonds, of which \$1,800,000 has already been issued. Walter G. Oakman of New York is president and Pliny Fisk vice-president. Other directors are Andrew Friedman, William M. Barnum, W. L. Lane, Charles D. Barney, George R. Sheldon and W. C. Kinney.

The Pratt & Whitney Company, Hartford, Conn., is to erect a new foundry building on Beach street. It will be of brick and steel construction, 116 x 210 feet, with a wing 43 x 90 feet. The structure will be one story in height and the main section will have a gallery along one side.

The New England Granite Works, Concord, N. H., will be in the market for a steam hoisting engine and boiler in the very near future to replace equipment destroyed in a recent fire.

Frank K. Moore, dealer in wood working machinery, Boston, has established a store at 61 Washington street North. Mr. Moore has been located in a part of the store of the Prentiss Tool & Supply Company, Oliver street.

The Brown & Sharpe Mfg. Company, Providence, R. I., has nearly 3300 men on its payroll, which is an indication both of the present prosperity of the business and also of its rapid growth, the shops having been practically doubled and the working force increased in corresponding ratio during the past five years. The company is operating some of its departments with two shifts of men, business demands requiring night work.

## Chicago Machinery Market.

CHICAGO, ILL., November 7, 1905.

Both the Chicago & Northwestern and Frisco railroad systems have been placing machinery contracts with local dealers during the week. The former purchased considerable equipment, mostly small tools, for its Green Bay, Wis., shops, and considerable equipment for its shops at Clinton, Iowa, was purchased some time ago. The Frisco System has purchased a large number of small tools for its different shops, but as yet the large tools remain unplaced. Contrary to its usual policy no general list was sent out, the tools required being specified and those dealers representing the manufacturers of them were asked for prices. Railroad purchases of machine shop equipment this year are far ahead of those of previous years and new lists continue to be promulgated by different roads almost every week, indicating that the heavy buying movement is by no means over. The Big Four Railroad contemplates improvements costing several million dollars and a large part of this appropriation will be spent in the purchase of new tools for equipping its shops at Danville, Ill. The Allis-Chalmers Company, Milwaukee, continues to buy miscellaneous machinery for increasing the output of its Bullock plant at Cincinnati, Ohio, and negotiations are still under way for the machinery required in equipping six new buildings it is adding to its plant at West Allis, Wis. The Illinois Steel Company has just closed for a number of punches, shears and hot saws for the addition which it is erecting to its rail mill at South Chicago. Most of the equipment was placed with Eastern manufacturers. General demand continues good and the buying of iron working tools is by no means limited to any one industry. Sales from store are heavy and dealers are unable to keep up stocks, especially in view of the poor deliveries that manufacturers are now making. On large boring mills deliveries cannot be made in less than six months, and manufacturers of large planers and milling machines are from two to three months behind on their orders.

### Machinery Requirements.

The Chicago Southern Railroad, Chicago, is about to begin the construction of repair shops, an engine house, hotel for the employees and other buildings at Faithorn, Ill. The contract for their construction has been let to M. Yeager & Son, Danville, Ill., at an approximate cost of \$425,000. The engine house, which will take the place of the usual round-house, will cover 249 x 315 feet, with an extension 80 x 149 feet to be used as a machine and blacksmith shop, storage and department offices. The engine house will be provided with two transfer tables for placing locomotives in stalls and one overhead crane for repairs. There will also be two drop pits for locomotive drivers and two for trucks. The oilhouse will be one story, 22 x 38 feet, of fire proof construction, and will be provided with eight steel tanks. The power house will be 62 x 89 feet and will be equipped with four water tube boilers, three electric generators, one duplex air compressor and locomotive boiler cleaning apparatus. The yard office will be one story, 46 x 98 feet, and will contain ten offices. The storehouse for heavy repairs will be 32 x 103 feet, and there will be two small buildings for light repairs, each 23 x 54 feet.

The Chicago & Northwestern Railway Company is installing or will install in its Clinton (Iowa) shops the following machinery: One slotter, one shaper, one 48-inch boring mill, one 36-inch triple geared engine lathe, one 15-inch lathe and one axle lathe, one 48 x 48 inch by 16-foot planer, one Yankee twist drill grinder, two wet tool grinders, one power hack saw, one 90-inch wheel lathe, two return tubular boilers, one large cleaning vat with crane, one 51-inch boring mill, one four-spindle drill. The company has placed an order with the Marshall & Husehart Machinery Company, Chicago, for a miscellaneous lot of tools for installation at its Green Bay, Wis., shops.

The Model Gas Engine Works, Auburn, Ind., which was recently purchased by J. W. White and others of Fort Wayne, will be removed to Peru, Ind., early in the spring,

the latter city having given a bonus of \$20,000 and 5 acres of land for the erection of a plant. The plant will constitute a main factory, 160 x 300 feet, and office and other buildings necessary for the business. The present stockholders of the company are John W. White and Max B. Fisher of Fort Wayne, R. A. Edwards and R. H. Bouslog of Peru and E. A. Myers of Auburn. The business of the company is reported to be much better now than it has been at any time, orders for carload shipments being on the books for the following among other points: Los Angeles, Cal.; Chihuahua, Mexico; City of Mexico, Cuba and Java. The line of manufacture includes gas and gasoline engines and automobiles.

The Humane Horseshoe Company is the name of a new company just incorporated at Lima, Ohio, with a capital stock of \$25,000. The officers are J. Oscar Hover, president; J. H. Blattenberg, vice-president; D. C. Dunn, secretary, and J. E. Grosjean, treasurer and general manager. The company has purchased 2½ acres of ground on Bellefontaine avenue and closed contract for the erection of an up to date plant. A complete equipment will be required, including press, forges, dies and shafting.

J. F. Dornfeld, Chicago, is engineer in charge of the erection of a pneumatic automatic kiln for the Niagara Malting Company, Buffalo, N. Y. Plans and specifications are now being prepared for the machinery, which will include grain handling equipment and apparatus for the entire plant.

The Chicago Bridge & Iron Works, Throop and 105th streets, Chicago, will erect a machine and blacksmith shop, 108 x 159 feet, one story in height. The building will be built and equipped by the company.

The J. A. Sundberg Company, manufacturer of iron and steel forgings, Chicago, will erect a machine shop 45 x 100 feet. Equipment will be purchased early in the spring. The building will be a part of the present forge plant at 261-267 West Kinzie street.

The Seng Company, Chicago, manufacturer of hardware specialties for the furniture trade, will erect a large addition to its plant at 47-51 Dayton street. Some machinery will be purchased for the equipment of this improvement, but it is too early to give details on this point.

Hirsh, Stein & Co., Hammond, Ind., who are erecting two factory buildings, 108 x 167 feet and 75 x 100 feet, respectively, are in the market for motors, fans and other electrical equipment.

The Buchanan Cabinet Company, Buchanan, Mich., will rebuild immediately its plant which was recently destroyed by fire and will require an entirely new line of wood working machinery, elevator and 75 horse-power engine.

E. A. Hodge, Portsmouth, Ohio, is receiving estimates on a 30 horse-power boiler, a four-sided molder, a self feed rip saw and jointer and a band scroll saw.

### Power Work.

The Compania Electrica de Zacatecas, which was formed some time ago in the city of Zacatecas, Mexico, to build and operate a modern electric light and power plant, has awarded the contract for the entire installation to the Schondube y Neugebauer Company, Mexico City. The electric machinery, transformers, &c., will be manufactured by the Allgemeine Electrical Company of Berlin, Germany. The electrical equipment will be driven by gas engines of about 200 horse-power, each built by the Koerting Works of Hanover.

The Traverse City Canning Company, H. L. Wiegand, Jr., superintendent, Traverse City, Mich., will receive estimates on tubular boilers 60 to 100 horse-power and steam pumps 200 to 300 gallons per minute capacity.

Contracts aggregating \$200,000 for the work necessary to transmit to Chicago the horse-power to be generated by the Sanitary District of Chicago at Lockport, Ill., have been let to the lowest bidders. The Whiting Foundry & Equipment Company, Harvey, Ill., secured the contract for an electric crane at \$5800.

The National Electric Company, Milwaukee, Wis., manufacturer of Christensen air brakes, air compressors and electrical machinery, has opened a Cleveland office at 416 Electric Building, in charge of George S. Hastings, who will handle the complete line throughout Ohio, Indiana, Michigan, West Virginia and New York as far east as Schenectady, and electrical machinery only in Pennsylvania as far east as Johnstown. The company has recently closed a contract with the Arbuckle-Ryan Company, Toledo, Ohio, for two 250-kw. engine type alternating current generators for installation at Canton, Ohio.

The Morse Brothers Machinery & Supply Company has succeeded the S. H. Supply Company in the sale of machinery and mining supplies, Eighteenth and Lawrence streets, Denver, Col. The company is Western agent for Nagle engines and boilers, Lidgerwood hoists, Cameron steam pumps, Gould power pumps, American compressors, Otto gasoline engines, Standard scales, &c. George G. Morse is president, B. P. Morse vice-president and D. G. Bolton treasurer.



## Philadelphia Machinery Market.

PHILADELPHIA, PA., November 7, 1905.

There has been no diminution in the buying movement in the local machinery market during the past week. About the same number of orders have been placed, but as the demand has inclined more toward the heavier tools, the aggregate value of the business transacted has increased. There is, on the whole, but little variation in the general demand. Most of the orders taken cover but a few tools, each and in many cases but a single one, the greater number of orders, however, making up the deficiency in their individual size.

Deliveries continue to influence sales to a considerable extent. Manufacturers of all classes of machinery and tools are busier than ever, and as a rule are taking on more business than they can handle promptly, even though many plants are working overtime, and in some cases are running on double turn in order to keep up with the demand. Deliveries under such circumstances are daily hardening and in view of the car shortages, of which the railroads are now generally complaining, bid fair to become even more extended than at the present time.

Foreign demand remains unchanged, and although but little new business has been taken recently in this territory, inquiries have increased along several lines, and both manufacturers and dealers look forward to more active conditions before a great while.

Some improvement is noticeable in the demand for the smaller engines, boilers and machines and a number of right fair sales have been made. Both manufacturers and dealers contend, however, that there is still room for considerable improvement in this branch of the trade. Dealers in second-hand machinery and tools continue fairly active. The lack of new tools for prompt shipment on both manufacturers' and dealers' floors has compelled buyers who must have immediate delivery to purchase second-hand tools, if only for temporary use.

Iron and steel foundries continue active. The steel casting plants as a rule have more work on their books than can be conveniently handled and prompt deliveries are in most cases hard to get. The local gray iron foundries are some what tied up with labor difficulties. Most of the jobbing foundries are contending with strikes of core makers and sympathetic strikes of molders and are therefore greatly handicapped in production. Some of the struck shops are operating shorthanded and as a rule foundrymen are firm in their refusal to grant the demands of the strikers.

A number of the local manufacturers and dealers are looking forward to a good share of business from orders to be placed by the Philadelphia & Reading Railway on the list placed before the trade some time since. It is now understood that purchases of machinery to the value of about \$200,000 has been decided upon by the company at this time, and although the formal orders have not yet come through the purchasing department it is expected that they will come out almost any day.

The Frankford Chain Works has recently added eight fires to its plant and will shortly put in eight more, giving a total of 37 fires and greatly increasing its productive facilities. This concern makes a specialty of block, crane and dredge chain, as well as proof coil, BB and BBB, and will shortly be in the market for a power hammer and winders and cutters for the large sizes of anchor chain.

C. J. Matthews & Co. will erect another addition to their morocco factory at Bodine and Willow streets. The building will be 35 x 70 feet, five stories in height and of fire proof construction throughout. The windows will be of wire glass, with metal frames, and the roof, floor and column construction will be of reinforced concrete. The building will have a freight elevator, also a 66 inch x 22 foot return tubular boiler with a 56-in steel stack. This is the third addition of this type that the company has added to its plant during the past year.

The Pennsylvania Railroad has under consideration the electrification of one of its lines between Camden and Atlantic City, N. J. It is understood that the company's old road, the West Jersey & Atlantic line, from Newfield to Atlantic City, and the West Jersey & Seashore Railroad from Camden to Newfield, are the ones on which the change is contemplated. Plans providing for the above changes are now in course of preparation, but at the time nothing definite has been decided upon.

The American Pulley Company continues active. There is a fairly good foreign demand for its all wrought steel pulleys and large numbers have been exported to New Zealand, Australia, England and the Continent. The domestic demand remains unchanged. Some extension deliveries in carload lots have been made in Southern and Western territories, while the local and nearby demand has been particularly good.

H. B. Underwood & Co., Incorporated, is busy in all departments of its plant. The repair department has an exceptionally large amount of work on hand, and the demand for portable tools is steadily improving, particularly for 28-inch rotary planing machines, for which a number of orders

have recently been taken and sales of railway shop tools during the past month show an increase of full 50 per cent. when compared with a corresponding period last year. Portable cylinder boring bars, rotary valve seat planing machines and portable milling machines have been shipped during the past few weeks to many different railroads, distributed in all sections of the country.

The Nazel Engine & Machine Works has taken orders recently for a number of special centering machines as well as for a varied class of special tools and machinery, on which class of work this concern is particularly busy. It has recently shipped a number of beading machines for brass shell work to local and other parties, and has others in course of construction.

The Energy Elevator Company notes quite an increased demand during the past few weeks for both power and electrically operated elevators, and orders for a number of each have been taken. Hand elevators also continue in good demand, and deliveries of this type of lifts have been made to Bucknell University, Lewistown, Pa., and other parties. A special invalid lift is being installed at Rosemont, Pa., while a large electric elevator is to be installed at the Lester Piano Works, Lester, Pa. A power, basement lift is to be furnished the Arcade Building, this city, and a number of hand power freight lifts are being furnished a number of local customers.

The Baldwin Locomotive Works during the month of October completed 230 locomotives and shipped 225. This is a new high record of production for this concern, the best previous one being made in the month of July last year, when 220 locomotives were turned out. The Baldwin Works now has over 17,000 employees on its payroll at the local plant and over 3000 at the Lewistown works, the total being close to 20,250 employees, which is the greatest number ever employed by this company. Orders for locomotives are being received in good quantity, both from railroads as well as from individual concerns, one recent order being for 50 heavy freight engines for the Philadelphia & Reading Railway Company. All departments of the Baldwin Works keep busy, and it is expected that with improvements contemplated and already under way (mention of which has already been made in these columns) that the facilities of the plant will be so improved that even a greater production than that of the past month will shortly be possible.

## New England Machinery Market.

WORCESTER, MASS., November 7, 1905.

The matter of deliveries has become more and more perplexing to the machinery dealers with each succeeding week. It is a dangerous matter to promise a customer the delivery of a machine within a prescribed limit of time, as has been proved by frequent disappointments. A quotation from a manufacturer made last week is no basis upon which to make a promise of delivery this week. The manufacturers of machine tools themselves complain of the annoyance to which they are necessarily and constantly subjected of telegraphic and written duns where machines cannot be delivered at the appointed time. The dealers have recovered from the little depression of a week ago and report a comfortable amount of business, some of them an almost uncomfortable amount, with the promised deliveries constantly extending into the future.

The extreme demand for electric motors and the consequent slowness of delivery on the part of the great electric companies has made manufacturers and dealers shy of bidding on Government contracts for motor driven machine tools. The specifications are onerous, as a rule, and there are forfeits for nondelivery on the agreed date. The electric companies appear to have gotten beyond the point in the volume of their business where they can keep their promises, and they are now slow to promise anything within the immediate future. It has been suggested that the Government adopt a standard type of motor and purchase it direct from the manufacturers of electric equipment, leaving the machine tools men to bid on machines equipped ready to take the motor. The penalties for nondelivery often eat away all of the dealer's commission and also much of the profit of the manufacturer when he sells direct to the Government.

The tendency to advance prices of machine tools continues. It is announced in Boston that the Niles-Bement-Pond Company has increased prices on most of its lines from 5 to 7 per cent., making an average, including all lines, of perhaps a little more than 5 per cent. J. E. Snyder, Worcester, Mass., manufacturer of drills, has advanced prices 7½ per cent. Beaman & Smith, Providence, R. I., have put up prices when figuring on special machinery, though the standard lines have not been changed, the advances being made commensurate with the advance in cost of labor and materials. Manufacturers of special machinery generally are taking increased costs into account in figuring business. At least one other of the New England manufacturers of milling machines has advanced prices to conform with the new schedules inaugurated by the Brown & Sharpe Mfg. Company, Providence, R. I., and the Cincinnati Milling



Machine Company, Cincinnati. Neither J. E. Snyder, the Brown & Sharpe Mfg. Company nor Beaman & Smith is a member of the National Machine Tool Builders' Association.

The L. W. Pond Machine & Foundry Company, Worcester, Mass., has abandoned the manufacture of metal planers, which the company and its predecessors have built for many years. The company plans to take up an entirely new line of business, concerning which no announcement is yet ready. An extensive machine shop business will be continued in connection with the foundry and the company will be prepared to furnish all repairs that may be required from time to time by the present users of the Pond planers. The foundry end of the business has grown to large proportions in the past few years, during which period several additions have been necessary, and at the present time a foundry extension is being built, which will very materially increase the capacity. These recent extensions are of the latest foundry design and equipped according to the most advanced ideas of modern foundry practice.

The Pond planer business is an old one. It was established in Worcester years ago, the shop being located on Union street, L. W. Pond and his son, David W. Pond, conducting the business together. The two finally separated, David W. Pond went to Plainfield, N. J., where he built large shops, the business later consolidating in the Niles-Bement-Pond Company. Afterward the L. W. Pond branch of the business was reorganized, H. C. Fish, prominent for years in the machine tool business of Worcester, and Caleb Colvin, a prominent iron founder, with several other gentlemen, taking it and making L. W. Pond the manager. When Mr. Pond died Messrs. Colvin and Fish acquired full ownership, and later Mr. Colvin bought Mr. Fish's interest, and moved the business to the present location adjacent to the Colvin foundry. In 1902 the machine and foundry business were consolidated as the L. W. Pond Machine & Foundry Company, and M. T. O'Leary was made the manager, which office he will continue to hold.

The Becker-Brainard Milling Machine Company, Hyde Park, Mass., has added two new sizes to its line of standard geared head machines. The standard Nos. 2 and 3 machines have been augmented by the sizes Nos. 1½ and 4, which makes the line very complete, needing only the addition of the No. 5 to fill it.

The Prentice Bros. Company, Worcester, Mass., has added several standard sizes to its line of geared speed upright drills. The 30-inch size was built, and to this has been added 26 and 33 inch machines. The line of geared head high speed lathes has been increased by two smaller sizes, 12 and 14 inch, the demand for these sizes having led the company to build them. This same lathe had previously been manufactured in sizes from 16 to 32 inches.

Clinton K. Hunter, Norwalk, Conn., has opened a machine shop in the rear of the Norwalk Heating & Lighting Company's office on Main street. The shop is fitted to manufacture novelties and do general manufacturing, as well as repair work.

F. E. Wells & Son Company, Greenfield, Mass., has assumed control of the Automatic Machine Company of that town, and the two factories will henceforth be under one management, the office to be in the Automatic Company's shops. The name of the F. E. Wells & Son Company will remain unchanged and the Automatic Machine Company will be operated under the Wells Company's name. The Wells Company manufactures pipe tools and the Automatic Machine Company screw machines and various other machine tools.

The recommendations of improvements at the Portsmouth Navy Yard are interesting machine tool men, for if they are favorably acted upon \$100,000 will be expended for new tools, which are said to be badly needed, if facilities for doing repair work shall be commensurate with those for docking.

The Boston office which represents the Niles-Bement-Pond Company and the Pratt & Whitney Company reports the past year to have been a record one. The business of the Niles-Bement-Pond tools increased 33 per cent., that of Pratt & Whitney 25 per cent., or at any rate, that figure would have been reached had it been possible to get delivery to meet all of the demands of customers; and the business in other lines was materially greater.

Efforts have been made by the Amalgamated Association to settle the long strike at the sheet mills of the Whitaker-Glessner Company, Wheeling, W. Va., and Martin's Ferry, Ohio. P. J. McArdle, the new president of the Amalgamated Association, spent some days in Wheeling recently in conference with officials of the company, but as yet no settlement of the strike has been reached. It is understood that many of the men have become tired of the long idleness and are anxious to return to work. It is not improbable that the company may in the near future open these mills to nonunion men and operate them independent of any labor organization.

## Cleveland Machinery Market.

CLEVELAND, OHIO, November 7, 1905.

Cleveland retail dealers say that the demand for machine tools of all kinds is steadily improving, and at present it is considerably heavier than at any time this year. Two or three prominent dealers say they are experiencing the heaviest demand they have ever known. The call is general and for all classes of tools, but as has been noted for some time past, there are few large orders for complete shop equipments or for a number of tools from any one concern. Instead there is a healthy demand for tools for additional equipments and replacements from nearly every concern doing business in this district. Retail stocks have become badly depleted, and the question of prompt deliveries is getting worse instead of better. There seems to be no limit to the number of tools being bought by automobile manufacturing concerns in this territory, for it appears as the season advances the prospects for a great year grow brighter and the manufacturers are installing additional machinery to take care of an output beyond that which was figured on a month or so ago. A number of new power plant propositions are being developed in this district, and another branch of industry which gives forth sure indications of continued prosperity in all branches of iron and steel manufacturing is the shipbuilding industry of the Great Lakes. There seems to be no limit to the number of huge ore carriers that are considered necessary for taking care of the steadily increasing output of iron.

The Cleveland Twist Drill Company is preparing to equip an extensive addition to its plant, which has been under way for some weeks. The building is three stories high, 85 x 200 feet, and it will be equipped with automatic machinery for increasing the company's output of twist drills and special tools.

The Cleveland House Wrecking Company has recently been formed to handle and install new and second-hand contractors' machinery, conveying machinery, steam shovels, stone crushers, steam and electrical machinery, machine tools, &c. It has fitted up a large warehouse and yard on Stone's Levee, accessible by switches from the Baltimore & Ohio and Big Four railroads. The building is 110 x 260 feet, three stories high, and is surrounded by 3 acres of land. A 30-ton traveling crane and several smaller cranes have been installed for handling material. The company is installing two electrical ore loading and unloading outfits, each equipped with 5-ton clam shell buckets, at the plant of the Algoma Steel Company, at the Canadian "Soo," and a large coal elevating outfit for the Wabash Elevator Coal Company at Cleveland.

The Brown Hoisting Machinery Company reports a greatly increased demand for its standard products, this being especially marked in the locomotive crane and grab bucket departments. The company has several large contracts for ore and fuel handling outfits pending.

The Farmers' Mfg. Company, Sebring, Ohio, has failed and the equipment will be sold at sheriff's sale. The city has closed a deal with the Keystone Steel Company, a company recently incorporated under the laws of West Virginia with \$200,000 capital stock, whereby it will occupy the plant and will equip it for the manufacture of cast steel edge tools. Richard Jones of Pittsburgh will be manager of the new company.

The Northern Ohio Traction & Light Company of Akron will make important additions to its power plant equipment. It will install a 1500-kw. Curtiss turbine with additional boilers at its Akron plant and additional equipment at its Bedford plant. R. Trumbull is chief engineer of the company.

The Lake Brady Development Company, Ravenna, Ohio, has been formed with \$350,000 to make extensive improvements at Brady's Lake, a famous resort. The improvements will include the erection of an extensive water works, electric light and power plant. W. A. Calhoun and W. G. Jackson are at the head of the company.

W. E. Stone of Cleveland, and W. E. N. Hemperly of Massillon have formed the Forest City Motor Car Company of Massillon, and they are equipping a factory in that place for the manufacture of light gasoline automobiles.

The American Clay Machinery Company, at its Bucyrus, Ohio, plant, is erecting an addition 50 x 80 feet for the production of dry cars, transfer cars and turn tables. The shop will have an independent power plant operated by a gas engine.

The Board of Trade of Fostoria, Ohio, has been successful in financing the proposition of the Fostoria Motor Car Company, capitalized at \$300,000. The company agrees to erect a factory at once and build 200 automobiles the first year.

The Warren City Tank & Boiler Works, Warren, Ohio, has broken ground for an addition 115 x 135 feet, which will be used in the production of steel plate and structural steel. Considerable new machinery will be installed.

The Field Foundry & Machine Company of Findlay, Ohio, has been formed by Samuel Field and others and it

will establish a foundry for the production of a number of appliances for the glass trade. Machinery for the work is being purchased.

The American Bridge Company is overhauling and improving its plant at Canton, Ohio, which has been closed for a long time. Considerable new machinery of heavy type is being installed and the plant will be placed in operation in the near future.

## Government Purchases.

WASHINGTON, D. C., November 6, 1905.

The Isthmian Canal Commission will shortly purchase two band saws, two automatic saw setting machines, one 20-inch pattern makers' lathe, one car sill and timber dressing machine, one 10-inch lathe with 4-foot bed, one 18-inch lathe with 8-foot bed, one 36-inch engine lathe with 24-foot bed, one 30-inch upright drill, two sets power plate bending rolls, two double portable punch and shears, two valve reseating machines, one 24-inch engine lathe, one 12-inch lathe, one 28-inch upright drill, one 24-inch planer, one 20-inch drill.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until December 5 for the following machinery for the Eastern navy yards: Schedule 220, emery grinding machine, lathe, molding machine, pipe cutting machine, shaper; schedule 221, band sawing machines, pattern machines, cut off saw, rip saw; schedule 222, planer, pneumatic drills, grinders, metal and scroll saws, steam hammers, centering machine, gap lathe and milling machine.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 21 for a quantity of supplies for the Eastern navy yards, including motors, hydraulic jacks, pressure pumps, &c.

Joseph D. Davidson, quartermaster, Fort Screven, Ga., will receive bids until November 27 for enlarging pump-house and installing boiler and pumps.

The following bids were opened October 31 for supplies for the navy yards:

Bidder 9, Alliance Machine Company, Alliance, Ohio; 13, Baker & Hamilton, San Francisco, Cal.; 15, Brown Hoisting Machinery Company, New York; 22, Burke Electric Company, Erie, Pa.; 26, Case Mfg. Company, Columbus, Ohio; 28, William Wirt Clarke & Son, Baltimore, Md.; 30, Crocker-Wheeler Company, Ampere, N. J.; 37, Cleveland Crane & Car Company, Wickliffe, Ohio; 61, R. W. Geldart, New York; 64, Richard H. Grey, San Francisco, Cal.; 68, General Electric Company, Schenectady, N. Y.; 76, Handlan-Buck Mfg. Company, St. Louis, Mo.; 80, Harron, Rickard & McCone, San Francisco, Cal.; 90, J. B. Kendall, Washington, D. C.; 99, Manning, Maxwell & Moore, New York; 119, Niles-Bement-Pond Company, New York; 120, Northern Electrical Mfg. Company, Madison, Wis.; 126, North Penn Iron Works, Philadelphia, Pa.; 131, Pacific Hardware & Steel Company, San Francisco, Cal.; 134, Pawling & Harnischfeger, Milwaukee, Wis.; 138, J. B. Roache, Brooklyn, N. Y.; 150, Shoemaker & Busch, Philadelphia, Pa.; 169, Tatum & Bowen, San Francisco, Cal.; 187, Yale & Towne Mfg. Company, New York.

### Schedule No. 159.

Class 12. One 2-ton overhead electric traveling crane—Bidder 9, 1-\$2355; 15, 2-\$1597; 26, 1-\$1975; 37, 1-\$1690; 119, 1-\$2070; 126, 2-\$1706; 134, 1-\$2100; 169, 1-\$1175, 2-\$1150.

Class 36. Seven electric motors—Bidder 22, \$1156.50; 30, \$1045.20; 68, \$954; 120, \$1291.50.

Class 37. Two two-motor electric traveling hoists—Bidder 9, \$2500; 37, \$1900; 119, \$2075; 134, \$1760; 169, \$2066; 187, \$1612.

### Schedule No. 161.

Class 44. Three hydraulic jacks—Bidder 13, \$252.50; 28, \$410; 47, \$362.34; 61, \$359.95; 64, \$435; 76, \$239; 80, \$276.90; 90, \$309.75; 99, \$352.27; 131, \$405.67; 138, \$320; 150, \$381; 169, \$324.

Under bids opened October 24 for supplies for the navy yards the following awards have been made:

Manhattan Supply Company, New York, class 55, one pipe bending machine, \$99.50.

Smith-Courtney Company, Richmond, Va., class 79, one wood turning lathe, \$279.

S. M. Price Machinery Company, Norfolk, Va., class 135, 12 hydraulic jacks, \$411.

Under bids opened October 10 for machinery for the navy yards the Hendey Machine Company, Torrington, Conn., has been awarded class 27, one milling machine, \$1510.

Class 30, one belt driven semiautomatic machine for making screw glands for surface condensers, has been canceled.

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, has been awarded by the United States Government the contract for crane service over two shipbuilding berths at the United States Navy Yard at Mare Island, San Francisco. This is one of the most important contracts in this line

that has been placed for a long time, comprising an immense steel trestle and a powerful high speed cantilever gantry crane mounted on same and traversing over the two berths.

## Trade Publications.

**Refrigerating Machinery.**—Henry Vogt Machine Company, Louisville, Ky. Catalogue, 6 x 9 inches; pages, 80. The catalogue contains quite a discussion of the principles of refrigeration and particularly of the absorption system, the advantages of which are enumerated. There follows a complete description of the absorption machine and the parts entering into the system, including the ammonia pump, generator, heat exchangers, ammonia condenser, &c. Auxiliary equipment employed in the manufacture of ice is also given some little space. A large part deals with fittings and valves, giving tables of sizes carried in stock. Useful information and tables of data are appended.

**Electrical Machinery.**—Northern Electrical Mfg. Company, Madison, Wis. Two bulletins. No. 51 deals with Northern ring type generators and motors for power and lighting service, and supersedes sections of bulletins 30 and 35 dealing with the same machines. It is profusely illustrated, showing the machines complete and unassembled and also their application and practical use. Bulletin No. 52 deals with electric equipment for farms, showing Northern motors used in driving cream separators, grindstones, pumps, churns, buzz saws, mills, cutting machines, elevators, &c.

**Railroad Motors.**—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Special publication 7140 and circular 1120. The first, prepared for distribution at the convention of the American Street Railway Association at Philadelphia, describes and illustrates in a general way the Westinghouse alternating and direct current motors and generators, systems of control and the system of catenary line construction. The circular deals with the Westinghouse No. 113 railway motor for direct current service. A number of diagrams give curves of the general performance characteristics with various gear ratios under different conditions of load and speed.

**Pneumatic Tools.**—Independent Pneumatic Tool Company, First National Bank Building, Chicago. Circular No. 5. Illustrates and briefly describes a number of the Thor platen air drills, reversible wood boring machines and pneumatic riveting, calking and chipping hammers. Specifications of sizes and capacities are given.

**Sheet Iron Machinery.**—E. W. Bliss Company, Brooklyn, N. Y. Catalogue; size, 5 x 7½ inches; pages, 80. Devoted to a presentation of machinery for the manufacture of pitted tin and black ironware. Some of the more important lines represented are inclinable power presses and upright power presses, hornling and wiring presses, shears, beading and flanging machines, can seamers, wire ring machines, foot presses and bench metal working machinery.

**Electrical Apparatus.**—Holtzer-Cabot Electric Company, Boston (Brookline), Mass. Two bulletins. No. 153 deals with testing magnetos and portable testing sets, and No. 201 with loud ringing extension bells for magneto signaling.

**Electric Generators.**—National Electric Company, Milwaukee, Wis. Bulletin No. 355. Gives a general description and details as to the construction of the National direct current belt driven generators.

**Air Brakes.**—National Electrical Company, Milwaukee, Wis. Bulletin No. 357. Outlines the Christensen air brake system and fully describes the improved features.

**Electric Lighting.**—Nernst Lamp Company, Pittsburgh, Pa. Circular. Contains a description and discussion of the Nernst 220 to 440 three-wire alternating current system for small cities.

**Electrical Testing.**—Electrical Testing Laboratories, Eightieth street and East End avenue, New York. Pamphlet. Contains a description of the electrical testing laboratories by Clayton H. Sharp, reprinted from the *Electrical World and Engineer*.

**Gas and Gasoline Engines.**—Raser Gas Engine Works, Ashtabula, Ohio. Contains a very condensed description of the construction of the Raser gas and gasoline engines, its principles of operation, advantages and specifications of sizes built.

**Electrification of the West Shore Railroad.**—On Monday of this week the preliminary work of electrifying the West Shore Railroad for a distance of 81 miles, between Rochester and Syracuse, was commenced. The Buffalo Pole, Line & Construction Company will erect a series of derricks on which will be strung three aluminum feed cables for the transmission of electricity from Niagara Falls, the work to be completed by March 1, 1906. It is expected that both freight and passenger trains on this section of the West Shore road will be operated by electricity by another summer.



## PERSONAL.

George R. Murray, who represented the Ingersoll-Sergeant Drill Company in the Central West for many years, acting as general superintendent of branches and agencies in the past two years, with headquarters in Cleveland, has been made general manager of sales for the Ingersoll-Rand Company. He is now located in New York, with offices at 11 Broadway.

B. G. Koether, former purchasing agent of the Hyatt Roller Bearing Company, Harrison, N. J., has left the purchasing department to become assistant sales manager of the company.

W. W. Butler, second vice-president of the Simplex Railway Appliance Company, has been elected second vice-president of the American Steel Foundries, to fill the vacancy caused by the resignation of W. D. Sargent. Mr. Sargent continues a director, having served on the board since the organization of the company.

Arthur Warren has resigned as manager of publicity for the Allis-Chalmers Company, Milwaukee, and will sail for Europe this month on a journalistic mission.

John M. Bush of the Ashland mine, Ironwood, Mich., has been made superintendent of the Crosby, on the Mesaba range, both being operated by the Cleveland Cliffs Iron Company.

C. H. McMillan, formerly superintendent of the open hearth department of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., has made an inspection recently of the steel plant of the Dominion Iron & Steel Company at Sydney, N. S., preliminary to some contemplated changes designed to increase output.

Arthur G. McKee, who was connected with the American Steel & Wire Company, Cleveland, Ohio, for six years, has resigned and established an office in the Rockefeller Building, in that city, as consulting and contracting engineer.

At a meeting of the directors of the Taylor Iron & Steel Company, High Bridge, N. J., held in New York October 28, several changes were made among the executive officers of the company. Lewis H. Taylor resigned as president, and was succeeded by Robert E. Jennings of Jersey City, the vice-president since the Taylor Iron & Steel Company was organized. Percival Chrystie was elected vice-president to succeed Mr. Jennings, and Knox Taylor was elected general manager. Lewis H. Taylor has for several years been anxious to relinquish the presidency, but the directors were unwilling to have him do so until the present time, when he insisted that his age was such that he should be relieved of all care and anxiety in business matters. In accepting Mr. Taylor's resignation the board unanimously elected him honorary president. Mr. Jennings is also president of the Carpenter Steel Company.

R. R. Shuman, late Western editor of *The Iron Age* at Chicago, who has gone into the advertising business, has formed a partnership with H. F. Miller, under the name of Shuman & Miller. The firm has just removed its office to the Manhattan Building, Chicago.

C. W. A. Koelkebeck, mechanical engineer, for the past four years with the Garrett-Cromwell Engineering Company and for ten years previous with Julian Kennedy, has joined the engineering staff of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, where his attention will be given to blast furnace, steel plant and rolling mill construction, &c.

W. C. Temple of Pittsburgh, president of the Cahall Sales Department in that city and identified with other manufacturing interests, has been lying seriously ill in Chicago for some weeks. Mr. Temple, accompanied by his wife, was on his way to the Orient.

A. C. Dinkey, president of the Carnegie Steel Company; W. P. Palmer, president of the American Steel & Wire Company; John Reis, assistant to W. E. Corey, president of the United States Steel Corporation, and W. B. Dickson, second vice-president of the corporation, last week made a tour of inspection of the South Sharon and Sharon plants of the Carnegie Steel Company. Some

time was spent in inspecting the wire rod and wire nail mill properties recently acquired by the Carnegie Steel Company from the American Steel & Wire Company. It is stated that some important additions are to be made to the Shenango Valley Steel Works, at New Castle, the property recently acquired to be used for this purpose.

It is reported that William E. Reis, formerly president of the National Steel Company, now living in New York City, will remove to his former home in New Castle, Pa., to accept the presidency of the National Bank of Lawrence County, the position having been made vacant by the death of William Patterson.

## Germany Urges Negotiation of Reciprocity Treaty.

WASHINGTON, D. C., November 7, 1905.—The German Ambassador to the United States, Baron von Sternburg, who returned to Washington from Berlin a few days ago, has submitted to Secretary Root a diplomatic note formally requesting the United States to make a reciprocal trade arrangement with Germany. Much interest attaches to this incident, as it is believed to foreshadow the settlement within the next thirty days of the important question as to whether a reciprocity treaty will be negotiated with Germany.

Although it has been stated in the cabled press reports that Baron von Sternburg brings with him full knowledge of his Government's position and is prepared to negotiate a treaty, it is probable that the actual work of framing a convention, if Secretary Root decides to take the step, will be conducted on behalf of Germany by certain of the special reciprocity commissioners who have negotiated the seven conventions which the German Government has concluded with Austria-Hungary, Italy, Switzerland, Belgium, Servia, Roumania and Russia. These commissioners will probably follow the Ambassador to the United States as soon as they are advised of the intention of the State Department to make a treaty.

Secretary Root will first be called upon to settle the important question whether the outlook for the ratification of a treaty is such as to justify him in undertaking the arduous task of formulating a convention in detail. It is the best opinion here, however, that it will not be necessary to frame a convention covering all the schedules of the tariff or one that will require to be ratified by the Senate in order to escape the levying on American products of the maximum rates of the new German tariff, which goes into force on March 1 next.

An official statement made public in Berlin a few days ago contains the first definite declaration of the intention of the German Government to denounce the only reciprocal trade agreement we now have with Germany—namely, the minor treaty of 1900—under which we receive the benefits of the minimum rates of the German tariff in return for certain concessions in the duties on cream of tartar, wines, brandies, works of art, &c.

Prince von Buelow states that the German Government "by no means wishes, however, that the present agreement should not be superseded by another arrangement," which is interpreted by State Department experts to mean that in the event that it is found impracticable to secure the ratification of a treaty covering the principal schedules of the tariff Germany will consent to the renewal of the minor convention of 1900, conceding to the United States, however, only a portion of the minimum rates of her new tariff. Such a convention would be in the nature of a compromise and could be proclaimed without the formality of reference to Congress for ratification, as the President is clothed with ample authority to make such a treaty by the terms of Section 3 of the Dingley act.

Whether such a minor convention would be of advantage to any branch of the iron and steel trade would probably depend largely upon the activity of the representatives of the trade in urging their views upon the attention of the State Department. There is reason to believe that Germany would make very important concessions in order to renew this convention.

W. L. C.



# HARDWARE

**O**VERSHADOWING all other trade gatherings in the number and influence of those attending is the annual coming together of merchants and manufacturers when the American Hardware Manufacturers' Association and the National Hardware Association hold simultaneous conventions in close relations with one another. At the present time these two great organizations are in session at Washington and the report of their meeting up to the time of our going to press will be found in the following pages. We also give a list of the Hardware associations of the country which is exceedingly suggestive as showing the extent to which organization is being carried in the Hardware field. The constant formation of State associations of retail merchants is a notable feature in this movement. This list will be of special interest to manufacturers in view of the fact that there is a marked tendency on the part of the retail associations to arrange for the display of exhibits in connection with their annual conventions, and manufacturers are more and more finding it advantageous to be represented at such gatherings. Such contact between the manufacturers and the distributors of goods indicates a wholesome tendency in the trade. Manufacturers have much to gain by meeting the merchants who are the channel through which their goods find their way into the hands of customers, while the retail merchants gain greatly by acquaintance and conversation with representatives of those who make the wares they handle. A practical problem is obviously presented as to the extent to which manufacturers may deem it advisable to avail themselves of the opportunity thus presented, but the question is certainly deserving of their consideration.

As the use of the trolley for the carriage of freight has developed gradually and under a variety of circumstances and conditions, and is thus far an incident rather than an important department of the business of the trolley lines, it is not to be wondered at that the service is frequently defective and unsatisfactory in various respects and likely to require control and direction with a view to the public interests. An example of this is furnished in the fact that there is a tendency with many of the street railways which are doing an express business in connection with their other traffic to reserve to themselves the right to discriminate between times and conditions in performing this service. The Massachusetts Railroad Commission, which has taken the lead in many rules which have afterward become general has promulgated a general order in which this and other matters are touched upon. It refers to the fact that several companies seeking to avail themselves of the statute under which street railway companies are permitted to carry freight have filed petitions asking unrestricted authority to carry freight of every kind, coupled with the right to refuse to perform this service upon any occasion when in the judgment of the management it is deemed undesirable. The commission, however, denied such petitions, holding that it is hardly conceivable that the Legislature intended in this way to give companies all the privileges of the common carrier, with the power to throw off the attendant burdens whenever so disposed or to give them such abundant authority for the practice of discrimination.

This is a wise ruling. The very nature of the country which the street railways serve in carrying express mat-

ter renders it imperative that there shall be no discrimination toward any individual in favor of or against him, and that the service shall be constant, barring only insurmountable physical difficulties, such as storm or flood. The electric railway should be compelled to live as nearly up to a perfect service as the railroad. The suburban communities of a State expect to have the best of service in payment for the privileges extended to a common carrier. In marketing their products such a service is necessary if it is to be depended upon at all.

The Railroad Commission, after pointing out that general supervision by that body is intended by the statute, goes on to say: "Passenger traffic upon the street railways is of paramount importance and freight business more or less incidental. The transportation of certain kinds of freight upon street cars through busy streets at any and all hours of the day would be a serious interference with other uses and enjoyments of public ways. Some articles ought never to be carried on these railways. In our opinion companies should be limited to the transportation of such goods in such manner as shall from time to time be described in schedules and statements filed at this office. In accordance with this view the board will require each petitioner to file a reasonably definite general description of the kinds of freight which it desires to carry and of the manner in which it proposes to conduct the business."

These rules or similar wise regulations are in a general way what must become general in other parts of the country where the suburban public and the city and town merchant depend upon the electric railways for a quick and cheap delivery of goods to points beyond the reach of the ordinary horse or power propelled delivery wagons. There must be some well defined limit as to what classes of freight the street railway shall carry and the regulation of its service in such a way as to facilitate the distribution of merchandise for the advantage both of merchants and their customers.

This is a matter to which the merchants in the various towns and villages served by trolley lines must give judicious and practical attention. While the trolley comes to every community with a certain amount of disturbance of former commercial relations, as the public are thereby frequently brought into easy communication with new trade centers and given new transportation facilities, it is obvious that merchants cannot look upon the trolley service with indifference or simply let it develop with such methods as the management may deem most conducive to their own financial interests. An efficient freight or express service by the trolleys may be an important means of increasing the trade of the town and thus of giving to each merchant new opportunities for the extension of his business. Those operating the trolleys will usually be ready to receive and prompt to act upon reasonable suggestions of merchants, especially in their united capacity, as to the means by which such service may be improved and the quantities of goods transported correspondingly increased.

In connection with this public spirited effort for the good of the entire community the wise and enterprising merchant will naturally give thought to the way in which the trolley can be used to advantage in extending his own

trade relations. Giving him as it does an immensely larger territory than was before within easy reach he would evidently fail to improve his opportunities if he neglected to cultivate such territory. Indeed it would appear that the trolley is another of the many influences which are summoning merchants of all classes to a new and aggressive enterprise and ingenuity in the carrying on of their business, thus lifting their calling to a higher plane, rendering business a more fascinating study and making them to be merchants instead of mere shopkeepers.

## Condition of Trade.

The continuance of fair and open weather quite generally throughout the country has been favorable to trade and merchants are fully occupied attending to the requirements of their customers. The demand upon the retail stores has been as a rule steady and has resulted in the depleting of stocks in not a few cases earlier than usual, so that the jobbers and manufacturers have been called upon to replenish them in many lines. This condition of things with the strength of the market and the prosperity which exists, an important part of which is the full employment of labor and the spirit of enterprise which is abroad, makes the volume of current business large, the feeling confident and the outlook decidedly hopeful. Difficulties connected with transportation continue and merchants complain of delay in the receipt of goods which have been unduly long on the way. Apprehension too of greater difficulty as the season progresses has the effect of making both manufacturers and merchants order ahead more freely than they would otherwise do. Values in the Hardware field are not only well maintained, but have an upward trend, especially in the goods which are immediately affected by the price of iron. The demand upon manufacturers has recently been so heavy that many of them are considerably behind their orders.

### Chicago.

The heavy buying not only of seasonable goods but of staple commodities as well which has prevailed at a record rate in the Western Hardware trade during the past two months will undoubtedly extend through the present month, judging from the volume of orders taken by the Hardware jobbers during the week. The prosperity of the West and Northwest as reflected by the jobbers' book is unparalleled, and the big crops have placed money in the hands of farmers for improvements that otherwise would have been postponed. This to a large extent accounts for the continued big demand for unseasonable goods such as are purchased in the spring months and which are used largely in the construction of farm buildings, cribs, &c. In fact, temporary elevator and crib construction on account of the inability of the railroads to move the crops has been heavier than ever before, all of the lines of Western roads being fairly dotted with these structures. Nor is there any abatement in the demand for Builders' Hardware, and manufacturers continue behind on deliveries. Chicago building operations during the first ten months of this year total \$52,655,270, as compared with \$35,785,790 during the same period last year, and the building permits issued last month show a total cost of \$4,918,155, which is only eclipsed by October, 1892, the year of the Columbian Exposition. The building trade generally is buying a better class of house trimmings than in the past, and the fixtures for the large buildings under way are all of special and elaborate design. Demand for such seasonable goods as Hatchets, Axes, Glass, Lamps, Weather Strips and Lanterns is heavy, while filling in orders for Stoves and accessories are numerous.

## NOTES ON PRICES.

**Wire Nails.**—There has been an unusual amount of new business booked by the mills during the first week of the present month. This is attributed to the continued open weather, which makes outside building operations possible and the desire to inclose buildings before winter weather sets in. Mills are shipping as promptly as possible at the urgent request of buyers. The tone of the market is firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....	\$1.80
Carload lots to retail merchants.....	1.85

**New York.**—Demand continues brisk in the local market for small lots from store. The competition of jobbers who bought large stocks before the recent advances results in irregularity of prices. Regular quotations for small lots from store are, however, \$2 to \$2.05, base.

**Chicago.**—The open weather existing throughout the West and Northwest has permitted building operations to be carried on much later than usual, and this condition is being reflected in the continued heavy demand for Nails. The tonnage usually received by the mills during the month of November is small as compared with the earlier fall months, but the specifications and new business received by the mills during the first week already indicates a movement greatly above the normal. Prices continue to be maintained as follows: \$1.95 in car lots to jobbers and \$2 in car lots to retailers, with an advance of 5 cents for less than car lots from mill.

**Pittsburgh.**—Shipments of Wire Nails by the mills in October on contracts placed some time ago before the advances in prices and also on current orders were very heavy and this month promises to be nearly as large if the present favorable weather continues. Buyers continue to urge prompt shipments in the fear of a freight blockade in the Pittsburgh district when the weather breaks, while the mills are doing their utmost to ship out as much as possible while present favorable conditions last. A fair amount of new tonnage is being placed, but the large trade bought heavily some time ago. The market is very firm and we are advised that official prices are being maintained except at a few points where some mills have a low freight rate, which in some cases is met by other mills not so favorably located. We quote Wire Nails at \$1.80 in carloads to the largest jobbing trade and \$1.85 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

**Cut Nails.**—Additional strength has been imparted to the market by some mills advocating \$1.70 as the base price. The length of time for deliveries on new contract orders is being shortened by some manufacturers in anticipation of higher prices. Buyers are covering future requirements to a greater or less extent. Quotations are as follows: \$1.65, base, for carload lots, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are held at \$1.75, base. In carload lots.

**New York.**—Demand for small lots from store is good, especially for 8 and 10 penny and 8 and 10 Flooring Nails. Prices are irregular owing to competition. Regular quotations for small lots from store are, however, on the basis of \$1.90.

**Chicago.**—Manufacturers and jobbers in anticipation of higher prices are selling for immediate delivery only. Consumers, on the other hand, are anxious to cover future requirements, but the mills refuse to sell beyond 30 days on account of the upward movement of raw material. Steel Cut Nails are quoted at \$1.82½ to \$1.85, base, for car lots, Chicago, and Iron Nails are held at an advance of from \$1 to \$2 a ton.

**Pittsburgh.**—While no official advance in prices of Cut Nails has been made, some of the mills are quoting \$1.70 and are not inclined to shade this price. Some of the mills are also refusing to sell for delivery very far ahead, believing that before long prices will be higher. Current demand is large, buyers anticipating future



wants quite freely. We quote Cut Nails \$1.65, base, in carload lots, f.o.b. Pittsburgh, an advance of 10 cents per keg being charged for Iron Cut Nails.

**Barb Wire.**—The mills are largely engaged in making shipments on contract orders, though there is a fair amount of new business being placed. Prices are reported as being well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.05
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

**Chicago.**—Liberal specifications continue to be received by the mills. New business is light, but prices are nevertheless well maintained. Quotations are as follows: To jobbers, Chicago, car lots, Painted, \$2.10; Galvanized, \$2.40; to retailers, car lots, \$2.15; Galvanized, \$2.45; retailers, less than car lots, Painted, \$2.25; Galvanized, \$2.55; Staples, Bright, in car lots to jobbers, \$2.05; Galvanized, \$2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

**Pittsburgh.**—There is a fair current demand, but most of the tonnage being shipped out by the mills is on contracts placed some time since, before prices were advanced. Buyers are anticipating future requirements, desiring to have as large stocks as possible while the present favorable weather lasts, knowing that with a break in the weather the mills will be handicapped very much in making shipments. The supply of steel is scarce and is interfering to some extent with operation of the mills. We quoted Painted Barb Wire at \$1.95 and Galvanized at \$2.25 in carload lots to the large jobbing trade, with the usual advance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

**Smooth Fence Wire.**—Mills have their books filled with orders, which will about take their output until the end of the year. Specifications on contract orders and considerable new business are fully employing the manufacturers' capacity. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

**Chicago.**—Specifications and new tonnage continue in excess of mill shipments, the consumption by independent Fence interests being at a record rate. Manufacturers experienced no difficulty in maintaining prices, which are as follows: \$1.80 to jobbers, f.o.b. Chicago, in car lots, and to retailers, car lots, \$1.85.

**Pittsburgh.**—The large trade is specifying very freely on contracts placed some time ago, shipments from the mills being heavy, while a fair current tonnage is being placed. The mills making Fence Wire have their product pretty well sold up to the close of the year. The market is firm and we are advised that official prices are being generally maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

The above prices are for base numbers, 6 to 9.

**Toe Calks, &c.**—P. F. Burke, South Boston, Mass., announces the following as his present quotations on Toe Calks and other goods of his manufacture:

Toe Calks.	Cents per pound.
Burke's Blunt, 1 prong and country.....	4 to 4½
Burke's Blunt, 2 prong.....	4½ to 4¾
Burke's Sharp, 1 prong.....	4½ to 4¾
Burke's Sharp, 2 prong.....	5 to 5½
Heel Calks.	
Burke's Blunt.....	4½ to 4¾
Burke's Sharp.....	5½ to 5¾
Burke's Welding Die.....	.60 cents each.
Burke's Horse Shoers' Foot Vise.....	\$10 each.

**Rope.**—The requirements are of about the same proportions as for some time, manufacturers referring to demand as good. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality Sisal, 8 cents per pound. Manufacturers of Cotton Cordage are busy, some being behind on their orders.

**Window Glass.**—According to reports, the factories that are now producing Glass, including hand and machine made plants, are producing at the rate of 600,000 boxes or more per month, and that with the additions of factories that are expected to be in operation by the middle of this month the output will be about 800,000 boxes per month. All but four factories, it is understood, are now operating under the "flat scale." The settlement of the wage scale has had the effect of steadying the market to some extent, though it has not increased the demand to any great extent, as jobbers do not appear to be buying very heavily. In the local market the cooler weather has stimulated demand to some extent. New York quotations are as follows: First two brackets, single and double strength B, 90 and 10 per cent. discount; all other sizes, single and double strength, 90 per cent. discount.

**Linseed Oil.**—There is a fairly good demand for small lots for immediate requirements. Large buyers do not regard the price for contract oil as attractive, the quotation being on the basis of 36 cents for State and Western Raw, for delivery to January 1, 1906, or later, according to the views of the crushers. Spot Oil, in car lots, is quoted on the basis of 35 cents for State and Western Raw. The market for small lots is not regarded as very strong. New York quotations for prompt delivery are as follows: City Raw, 42 to 43 cents per gallon, according to quantity; State and Western Raw, 40 cents per gallon. Boiled oil is held at 1 to 2 cents advance over raw.

**Spirits Turpentine.**—The market at this point is quiet, with prices firm and higher. Demand is light at advanced values. New York quotations are as follows, according to quantity; oil barrels, 71½ to 72 cents; machine made barrels, 72 to 72½ cents.

## REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM CHARLES A. TOBIAS, formerly of "The Tool Box," 1129-1131, Ridge avenue, Philadelphia, Pa., who will open a new and larger Hardware store at 2325 Germantown avenue. Mr. Tobias will carry a full line of Hardware, Tools, Cutlery, Paint, house furnishing and general supplies.

FROM L. SCHMIDT & SONS, Grand Junction, Col., successors to the Hardware, Wooden Ware, Stove and Sporting Goods business of E. M. Slocumb.

FROM W. W. MINTER, who has purchased the Hardware store of Bigers & Son at Troy, Kan.

FROM KENNEDY & ERNST, who have opened a retail Hardware, Stove, Paint and Sporting Goods store at Lawrence, Kan.

THE factory of M. Goulds Sons & Co., Newark, N. J., in which Trunk Hardware is manufactured, was partially burned out Friday, October 27, at the cost of one girl's life and the injury of several other persons. The damage was confined principally to the third and fourth floors, one of which was the lacquering and finishing department. The loss, which may exceed \$40,000, is now being adjusted by the insurance underwriters, and the firm hopes soon to be in a position to fill orders on a majority of the lines it makes, arrangements having already been consummated for continuing some branches of the work in other buildings. Much of the plant was uninjured.

### TRADE ITEMS.

A YEAR or two ago the patent on the well-known Stillson Wrench, made by the Walworth Mfg. Company, Boston, Mass., expired, and since that time, as is usually the case with patented articles which have had a wide and extensive sale, a number of imitations of the Stillson Wrench have been put on the market by other manufacturers. The genuine Stillson Wrench is, however, we are advised, still fully holding its own in the market, notwithstanding that the imitation patterns are sold at somewhat lower prices. The manufacturers are thus, as they are well entitled to, continuing to receive the support of the trade for an article which has made a place for itself as a result of the company's efforts and skill in making and marketing it.

S. L. ALLEN & Co., Philadelphia, Pa., are distributing an attractive booklet illustrating and describing their Flexible Flyer Sleds; also a card lithographed in actual colors, which folds in the form of this Sled, indicating the characteristic patented steering device which gives it its name. It will be remembered that the runners of the Flexible Flyer are of spring steel, very strong and rigid vertically, but free to bend sidewise, and are easily controlled with a cross bar operated by the feet or hands. Thus the Sled is steered without dragging the foot and its speed is not retarded.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis., has recently been allowed a patent on its process of making Gray Enameled Ware. This, it is stated, places the company in a position to increase largely its output of Enameled Ware, which now comprises three complete lines—American Blue and White, Cream City Gray and Opaline.

## The Washington Conventions.

### Annual Gathering of the American Hardware Manufacturers' Association and the National Hardware Association.

(By Telegraph.)

THE ninth annual convention of the American Hardware Manufacturers' Association and the eleventh annual convention of the National Hardware Association are now in session in the city of Washington. The gathering promises to be a notable one, both in point of size and of interest. Early on Tuesday, the day before the conventions opened, it was apparent that delegates were coming early, from the rapidity with which the badges prepared for each individual were claimed at the different headquarters. These badges—blue for the manufacturers and red for the jobbers—soon became the dominant feature in the lobbies of the New Willard and Arlington hotels, which had been chosen as the respective headquarters.

#### An Excellent System of Identification.

was employed, each member's badge bearing his own and his firm's name in good bold type, while the color of the ribbon attached indicated at a glance his position as jobber or manufacturer. While the occasion is one which would naturally tend to fellowship and good feeling, it would seem that there is an unusual atmosphere of cordiality everywhere prevailing and a marked spirit of optimism and enthusiasm, arising from the unexampled conditions of prosperity and promise throughout the whole broad land, every quarter of which is represented in these two great bodies of manufacturers and merchants.

#### The Chicago Special.

It is estimated that there were at least 200 Hardwaremen in the city Monday night, 130 of whom arrived at noon of that day on a special train from Chicago. The train left Chicago late Sunday morning with a jolly company, which was added to in the various cities at which it stopped on its way East. Sunday night a banquet was served which was referred to with much pleasure by all the participants. Passengers on this train were warm in their praise of W. H. Bennett, of the Lawson Mfg. Com-

pany, who had all arrangements in charge. They presented him with a gold watch as a token of their appreciation for his attention to their comfort and pleasure. On arriving in Washington the entire party was conducted to the White House, where it was accorded a private reception by President Roosevelt. Each member was personally introduced and received a few words of greeting in the President's usual hearty and happy style. In response to a sally by one of his guests, Mr. Roosevelt emphatically reaffirmed his determination not to stand for another term.

#### The Opening Session

of the jobbers' convention took place Wednesday morning at the Arlington Hotel and was largely attended. Members of the Manufacturers' Association, representatives of the press and others, including ladies, were invited to be present at this session, which was not of an executive character.

President Samuel A. Bigelow called the convention to order promptly and requested that all join in singing the national hymn, "America."

After prayer by Rev. D. J. Spofford, D.D., rector of St. Patrick's Church, President Bigelow delivered his annual address, which was followed by the report of Secretary-Treasurer T. James Fernley, both of which are given elsewhere.

Following Mr. Fernley's report Cyrus A. Birge of the Canada Screw Company, Hamilton, Ontario, an ex-president of the Canadian Manufacturers' Association, was introduced and addressed the convention briefly. He referred in a pleasant way to the protective policy of his country, by which it is hoped to build her up just as the United States has grown and expanded under the same system, and in conclusion paid a glowing tribute to President Roosevelt for the successful conclusion of his efforts for peace. Several officers of the Canadian Hardware Association were present in a body and were individually introduced to the convention.

The meeting then proceeded to the consideration of

#### THE CATALOGUE HOUSE QUESTION.

which was presented by the Joint Catalogue House Committee of the National Hardware Association and the National Retail Hardware Association. The latter organization was effectively represented by its delegates on this committee—namely, its president, W. P. Bogardus of Mount Vernon, Ohio; its secretary, M. L. Corey of Argos, Ind., and T. Frank Ireland, Belding, Mich.; S. R. Miles, Mason City, Iowa, and E. M. Bush, Evansville, Ind.

S. Norvell, chairman of the Joint Catalogue House Committee, on being presented to the convention stated that their intention was to get away from platitudes upon this subject and get down to stubborn facts. They believed, he said, that the manufacturers did not appreciate the conditions and they proposed not only to tell them but to show them by reproducing upon the screen which had been prepared printed matter sent out by the catalogue houses, pages from their catalogues showing the goods and prices offered and tabulated comparisons of the retailers' cost, the catalogue house price and the retailers' percentage of profit, or in some cases of loss if they met the price.

#### Address of E. M. Bush.

Mr. Norvell then introduced E. M. Bush of Evansville, Ind., vice-president of the National Retail Hardware Association. Mr. Bush asked how many manufacturers had studied the catalogue house publications to find out what was left for the retailer after he had met the price, as he is glibly advised to do. He gave figures to prove that on their small volume retailers cannot do business under 20 per cent. They cannot meet the price and their obligations at the same time. He said he did not pretend to know the manufacturers' cost, but he had intelligence to realize that there must be something above a mere advance on cost of production to cover wear and tear of machinery, salaries, rent, taxes and insurance. A similar margin must be allowed to the retail trade. Mr. Bush remarked that heaven and earth and perhaps some post office officials were being moved to increase the circulation



of catalogue house literature and gave his reasons for objecting to the numbering of rural mail boxes. What, he asked, is behind it? He warned the manufacturers that if they allowed the present state of things to continue and grow they would face a condition serious to themselves, as catalogue houses would form syndicates and become so numerous and strong that they would surely start manufacturing themselves. One system of merchandising or another must eventually prevail. Which affords the best representation to the products of the manufacturers. The catalogue house illustrates wares with small, indifferent cuts, setting forth their merits in type which it requires a reading glass to decipher. The retailer advertises them in his local paper, displays them in his show windows and on his shelves and hires wide awake salesmen to talk them. Therefore if you support the retailer you are fighting your own battles. The present marked demand for inferior goods may be attributed to catalogue houses, 10-cent, racket and department stores forever beating the price and looking for leaders.

They care nothing for real merit. The appeal of the retailers comes from the men who have made the market for the manufacturer's goods.

#### S. R. Miles' Address.

S. R. Miles of Mason City, Iowa, a member of the Executive Committee of the National Retail Hardware Association, also presented the subject from the point of view of that body, urging the manufacturers to forget for the moment their own previous ideas and put themselves in the retailer's place. He promised that facts, not generalities, would be presented by the stereopticon, which would be both comprehensive and convincing. To convince them that the catalogue house trouble was general he had sent through association secretaries to all parts of the country a large number of circular letters enumerating 32 lines generally carried and asking on how many it was necessary to meet the price. The answers indicated that the competition covered the entire

country and was about as effective in the extremes as in the central sections near the catalogue houses' doors.

Figures which he gave showed that the percentage of replies acknowledging difficulty was very large on every line mentioned, especially so on Mechanics' Tools, Stoves, Builders' Hardware and Sporting Goods. What he asked is the avenue of escape for the merchant who must meet the price on even 32 different lines of such character. What lines are left open on which he can redeem his business and make it pay? Answering the argument that retailers charged exorbitant prices, Mr. Miles had collected retailers' costs on 32 items which at catalogue house prices would net him a profit of \$1.62. Deduct a reasonable expense account and there is a loss to the merchant of 24 per cent. The costs in this example were placed lower than would be quoted to the average retailer, so that his condition is even worse than the figures indicate.

Some argue that conditions have changed and manufacturers must sell direct to retailers. Mr. Miles had collected through circular correspondence figures which he gave showing that direct sales the country over are now in such small proportions as to be almost inconsiderable. He believed the time had not come for the retailer to discard the jobber and carry two or three times as much stock, which he would certainly have to do.

Merchants in the smaller communities cannot do business on such a scale. The question is, Do the manufacturer need the retailers? They are ready to say nice things, but flattery will not do. They must have their names on the pay roll.

#### The Lantern Slides

were then shown with comment by Mr. Norvell, who concluded the discussion by intimating that the committee believed it had carried its campaign of education as far as possible, and would recommend that the subject of the catalogue house be dealt with from henceforth by other means.

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## ANNUAL ADDRESS OF PRESIDENT BIGELOW.

What more fit place to hold our eleventh annual convention than in the capitol of our country? What better time than in the closing months of a most eventful year, which has brought peace to two great nations, through the personal effort of our beloved President, Theodore Roosevelt? With armies of 500,000 men, veterans who had fought the fiercest battles recorded in history, each confident and anxious to renew the conflict, neither was willing to suggest a settlement. These were the conditions existing when he proposed a conference to arrange terms for peace. The world looked upon the realization of his suggestion as an impossibility. His position as President of a great nation, free from the petty jealousies and self interest of all other countries, added to his known honesty of purpose, eminently fitted him to accomplish this most difficult undertaking.

The sequel to this great triumph is now being developed in Russia, where it promises to give new life and liberty to millions of people who have been downtrodden for hundreds of years. Let us rejoice that our President has been the chosen Saviour to relieve all this distress and suffering, and that God has given him the power and strength of will to accomplish these great results.

In offering our tribute, I believe we can all subscribe to Secretary Morton's estimate of the man, whose honest integrity and indomitable will have enabled him to accomplish so much good for all mankind, and placed our country in the proud position of peacemaker for all the world: "He is, taken all in all, one of the most remarkable of all the great men who have occupied the White House. As earnest in his love of country as Washington, as far-seeing as Jefferson, as courageous as Jackson and as much opposed to human slavery in all forms as Abraham Lincoln, he stands robust in his integrity and sturdy in his determination that there shall be a square deal all around." Let his example guide us in the work of our convention.

## A YEAR AGO

we were on the threshold of the second great outburst of American industrial expansion. To-day we are in its midst. Looking about us we find labor of every condition fully employed, our factories are all working and producing a larger output than was ever known before. Pig iron, the base metal from which all Hardware products are made, was never in greater demand, many furnaces have withdrawn from the market, having sold their entire product for the first quarter of the coming year. All classes of buyers are still in the market, and all grades of iron are in demand. Notwithstanding advanced prices, buyers are seeking to make contracts extending far into next year, but few furnaces are willing to sell beyond April next.

## CONSUMPTION

at the present time has reached marvelous proportions. Prices have advanced over \$3 per ton in the past year. Coke, also an important factor in the reduction of pig iron to the finished products, is in active demand at higher prices. Ovens are heavily oversold and high premiums are being paid for prompt delivery.

Bountiful harvests have rewarded the farm laborers in every section of this great country. A high level of prices, both for farm products and for manufactured material, is increasing the

## FABULOUS WEALTH OF OUR COUNTRY

with rapid strides. A report from this city in September gives these facts regarding the country's crops in 1905: "The value of the farm products raised in the United States in 1905 will equal approximately the total value of all the gold mined in the last 30 years."

While the backbone of agricultural prosperity is represented by the three great speculative crops—wheat, corn and cotton—other products swell the total by many hundreds of millions of dollars. For example, the American hen lays \$145,000,000 worth of eggs per year, but it is worth about as much as the wheat crop and more than the cotton crop. In 1870 the country produced

287,000,000 bushels of wheat for a population of 38,500,000. This year it will produce 700,000,000 bushels for a population of 83,000,000.

The wheat crop would require 24,640 trains of 40 cars each to move it, more than half of the freight cars in the entire country. The 5,737,000 farms in the country are valued at more than \$20,000,000,000, and gross value of crops raised in 1890 was \$4,717,000,000, or 20 per cent. gross income, and yet the average return per farm is but \$800.

## THE DISTRIBUTION OF THE CROPS

is the marvel of the world. To-day 1,000,000 freight cars are hurrying the crops to the seaboard and to the various distributing points to feed our people. The 2,716,000,000 bushels of corn would occupy approximately equivalent to 3,380,000,000 cubic feet if closely packed, or space enough to cover the entire site of the "city" of London to a depth of 100 feet. Two years ago Benner prophesied the conditions as they now exist in 1905, and promised they should continue until 1911. Surely we should be thankful that we can share in this prosperity.

## THE SOUTHERN PLAGUE.

For four months our brothers in the South have been called on to fight a terrible plague, which has paralyzed business and brought sorrow and suffering to its people. With true American pluck and energy they have fought a bitter fight against a subtle foe, and, thank God! they have won. Let us hope they have done their work so well they may never be called upon to renew this terrible struggle again. To-day they are free to pursue their paths in peace and share in the general welfare.

## NEVER BEFORE IN THE HISTORY

of our country was there a brighter outlook for the industrial and commercial interests than exist to-day. During the past year your executive officers have labored diligently on the lines laid down by you at our last convention. The report of the various committees will give you the detail of their work and their recommendations should receive your careful attention and loyal support.

You will be called upon to discuss and advise your officers and committees on many vital and important matters. Our intercourse with manufacturers has been most cordial. Our membership was never larger or more united than it is to-day. The benefits from our association are increasing each year. Our customers, the retail dealers, appreciate our support and honest desire to improve the conditions that menace them. Intelligent, broad minded men govern their councils and use their influence to promote cordial relations with their jobbing friends.

In the two years your president has occupied that honorable position he wishes to thank the members of your Executive Committee and your secretary and all the members for their loyal support. No member ever refused to accept a committee appointment or to do any work assigned to him. His years spent in your service and his many warm friends will ever bring back pleasant memories, but none that he treasures more highly than the many kind and loving messages he received on his golden business anniversary.

## IN MEMORIAM.

Let us be grateful that death has taken from us so many less than in the preceding year. Members, rise while we read the names of those of our number who have joined the great majority since our last meeting:

Henry C. Millar, Charles Millar & Sons Company, Utica, N. Y., died in June, 1905. Mr. Millar had been identified with the commercial interests of his city for a number of years and had the confidence and respect of the entire community.

Edmund Orgill, of Orgill Brothers & Co., Memphis, Tenn., died in September, 1905, in the 81st year of his age. For 51 years he was identified with the Hardware interests of that city, was a man of high character and bequeathed to his family an untarnished name.

Fred Hinds, of Babcock, Hinds & Underwood, Birmingham, N. Y., died May 5, 1905. A young man who gave promise of great usefulness, esteemed by his friends and loved by his family.

Dosithe P. Patenaude, of A. M. Holter Hardware Company, Helena, Mont., died May 3, 1905, in southern California, where he had gone in the hope that his health



might be restored. He was generally in attendance at our conventions and took a great interest in association work. He will be missed by many friends.

William C. Peters, James M. Vance & Co., Philadelphia, died January 15, 1905. An honorable, conscientious, old time merchant, noted for dealing justly with his fellow men and taking great interest up to the time of his death in the uplifting of mankind.

James N. Frye, of Frye, Phipps & Co., Boston, Mass., died December 5, 1904, in the 76th year of his age. He was a successful merchant and a courtly, honorable gentleman, dearly beloved by hosts of friends.

#### ANNUAL REPORT OF T. JAMES FERNLEY.

Again, and for the eleventh time, it is our privilege to come before you with a report of the conduct of the work intrusted to your humble servant. We will not attempt at this time to give a detailed account of the work of the year, but, following custom, will during the three days of our convention report in detail regarding correspondence and conferences, as questions may arise during discussion.

During the year we have visited nearly all the members of our association excepting those in the extreme West. The members of our association have all expressed themselves as being well pleased with the work that was being accomplished by our organization. We have whenever possible during the year attended meetings of sectional and State associations, among others visited being the Southern Hardware Jobbers' Association, New York State Hardware Jobbers' Association and the Missouri River Hardware Jobbers' Association. We have been in constant communication during the year with all sectional and local associations and have been benefited thereby.

#### ONE HUNDRED AND TWENTY-EIGHT HOUSES

have signified their intention of having one or more representatives present at this convention. This is a larger number than has ever been present on any previous occasion, and this would indicate that the interest in the work of our organization is stronger than ever. Quite 70 per cent. of the membership will answer to roll call. Considering that the organization covers the entire country, and that about 10 per cent. of our members are located in the Pacific Coast States, we feel that the attendance at this convention indicates in no uncertain manner the strength of the organization.

#### RELATIONS WITH RETAIL TRADE.

We are very much pleased to report that the retail merchants of the country have built up a very strong organization and that to-day the National Retail Hardware Association of the United States is a truly representative body. The officers of this association and our own are on very friendly terms indeed and we are co-operating to the extent of our ability in our efforts to improve existing conditions.

#### CATALOGUE HOUSE COMPETITION.

A very large portion of the work of the secretary-treasurer during the year has been devoted to his duty as general secretary of the Wholesale and Retail Hardware Joint Committee, and it is very pleasing indeed to be able to report that our labors in this connection have been crowned with considerable success. Inasmuch as this is a subject which will be discussed at our meetings we will not go into detail.

#### RURAL MAIL DELIVERY.

Our attention was called through the columns of *The Iron Age* on September 21 to the order of the Fourth Assistant Postmaster-General providing for the numbering of rural free delivery boxes and the delivery of mail to the patrons of the rural routes when addressed by number.

We immediately wired the Postmaster-General protesting against the order and asking for its immediate rescinding. We also communicated promptly with the members of our organization and with the secretaries of the various commercial bodies, including Boards of Trade, Chambers of Commerce and commercial clubs throughout the country, asking them to take similar action. We were very much gratified indeed at the responses received, and as a result of concert of action from the various commercial channels the order has been

suspended. It is still necessary to be vigilant concerning this matter.

We would also call the attention of the members of our association to the importance of the necessity of carefully watching legislation in connection with the enactment of a Parcels Post bill. We find that a very large number of the members of Congress are in favor of the passage of such a bill, and it can only be prevented by systematic and active opposition.

#### CLASSIFICATION OF THE TRADE.

During the year a very large number of manufacturers have sought our assistance in connection with their efforts to meet the views of the jobbing trade. We have been very freely consulted regarding classification of the trade, and at all times have endeavored to be fair and impartial in suggestions made to manufacturers. As a rule we find that those who are attempting to be classed as jobbers and who are not entitled to jobbing consideration are not legitimate retail merchants, but are a type of concerns who are doing a general merchandising business, and who are jobbing other lines of goods, simply using Hardware as a side line. We feel that our efforts in connection with the classification of the trade are as much to the interest of the retailer as to the jobber.

#### FINANCIAL CONDITION.

Our financial report will show that our treasury is in a prosperous condition notwithstanding the fact that we have had some unusual expenses this year in connection with our catalogue house work.

The standing committees of the association have given very faithful attention to all correspondence placed in their hands. The Executive Committee without any exception have manifested a desire to so guide the work of the association that the interests of all the members should be properly protected. Our president has been in constant correspondence with the secretary of the association, and has generously given his time and talent in connection with our work.

The secretary-treasurer desires to thank the association for confidence reposed in him, and to express a hope that this, the eleventh annual convention, will be the most successful one ever held.

## TRADE WINNING METHODS

*This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.*

### POINTERS FOR THE HARDWAREMAN.

BY ON-THE-ROAD.

IT isn't necessarily a pessimistic sign that competition is so keen nowadays. Some one has said that "competition is the life of trade." It is the mystic, intangible something that makes men move and hustle, and so in the passing of better profits and the substitution thereof of very much smaller profit percentages there is sound reason. If in the old days profits were greater the population was smaller and needs were correspondingly fewer. On the other hand, profits to-day may be less, but the population is larger and the needs are greater because there are more people to need goods. And so the equation works itself out happily and the volume of business to-day is larger. Even though the profits be less in point of percentage, yet they can afford to be less since sales volume is larger nowadays. Large sales and small profits are the basis of the biggest business houses of the great cities—the department stores—and there are reasons and good ones to warrant that slogan.

The writer does some carpentering on his own account occasionally—in fact, it is his pastime—and finding him-

self in need of some Hardware recently, went to a fine establishment in his home city to get it. Though that's what he is employed there to do, a salesman very reluctantly condescended to ask me what I wanted, which was one, but not the good business way of finding out. I told him "Casters," whereupon he tossed a single Casters on the counter and looked wearily out of the door on the street. When I asked to see somewhat of an assortment the clerk put one more sample in front of me. Then I asked the price of one of them and

**Inattentive Clerks.** actually had to repeat my question before the clerk would take his eyes from the street and refer to a price-book. When

the high-collared "gent" answered he did so in a tone that was wonderfully patronizing. But I wanted Casters and got them. Were I running that establishment that clerk would keep his eyes, mind and attention inside the store, or else he would need to be interested outside of it. I have often wondered how a little bit of a basement Hardware store can manage to exist right next door to the big one above referred to. Perhaps the above clerk drives trade to it, as he very nearly did in my case.

The following statement, conspicuously displayed, is suspended in a New York City retail store in a position where every one entering the door cannot well avoid seeing it:

The policy of this house is absolute integrity, satisfaction, accommodation, with the purpose of winning and holding the confidence of every individual who enters its doors.

As a customer, it impressed the writer favorably, and so it probably does other customers. When the salesman said, after an article had been purchased, "If this is not satisfactory in every particular we will make

**Winning the Buyer's Confidence** it so," the printed statement meant even more to the customer than before. The position taken by the management in securing and maintaining a reputation for fair dealing, and announcing it in unmistakable language, helps the salesmen to sell goods, and is calculated to make transient purchasers permanent customers. And, by the way, all goods in this store were marked in plain figures.

One Saturday night recently I had nothing to do, so I strolled about the business section of a town of 50,000. It seemed as though everybody was out buying that night. Walking along I came to a brilliantly lighted market, a combination meat, grocery, dairy and green groceries shop. The place was immaculate in its appearance, all was white and clean, the salesmen in clean white uniforms, and everything about it betokened thrift, honesty, enterprise and hustle. Well, the place was crowded, and people were waiting on the walks for their turn to get inside. "There," thought I, "is a good paying business." A little further, only a door or two beyond the busy place, I came to another store, and as I peeped through the dirty windows I was surprised to find a dimly lighted store that offered the same sort of goods as its near neighbor. I went in, bought something as an excuse, but my visit was to see the difference. The store was old fashioned, the goods were fly specked and the clerks lazily waited for trade. There wasn't a single customer in the store—not one. My intuition taught me who the owner was and

**A Tale of Two Stores** I edged toward him. When I saw he wore the same fraternal watch charm as

I, I introduced myself in that fraternity of sincerest good, and I led him up the street. 'Twas risky, but I felt I was doing him a favor. Reaching the busy store I said, gently: "See that crowd? They are drawn by the appearance of the store the fresh, clean white paint, the white uniforms. Now, your goods are just as fresh as this man's, but they don't look so. If you want that kind of a crowd in your store, imitate this fellow's store, and, if you can, improve upon it." I was honestly scared

at my temerity in such plain talk, but I had nothing to lose or gain, while he had much at stake. A look of resentment came to his eyes, which gave way to a kindlier gleam, as he said: "My friend, I thank you. You are right. I have slept. Almost all of those people have traded with me, but left me. Now I see why. You have done me a service, and I thank you heartily." And I

**Did the Trade Come Back?** left him. The next Monday morning the store bore a notice that hid the whole front of it, and which told the public the store was closed for repairs.

Three months later I again visited that town, and again I had a Saturday night to myself, so I went down to the stores above cited. Lo, and behold! where the old one had been dull, dingy and empty, it was now a veritable beehive of energy and business. Its transformation was splendidly complete. Its owner had not imitated, he had outdone his neighbor in every detail. He had spent money, but every cent had counted, every dollar had been a wedge that would raise him to the plane where business would come back to him. Come back? His trade had come back with a rush. The other fellow had been forced to divide the business. When I again sought out the proprietor he gave me such a welcome as would carry to the heart of a wooden Indian, much less a live one.

## THANKSGIVING ADVERTISING.

WITH the near approach of Thanksgiving there is an opportunity for the progressive Hardware merchant to direct the attention of the public to some goods in his stock which have something to do with the success of the feast which generally characterizes the observation of that holiday. This will also serve to introduce a

## PROCLAMATION

**Whereas** by virtue of our great National peace and prosperity, it is again the privilege of the Nation's executive to set apart Thursday, November thirtieth, as a day of Thanksgiving in church, home and heart, and

**Whereas** by a custom that annual repetition has made an unwritten law that the spirit of Thanksgiving finds popular expression in hearty dinners, and

**Whereas** being unable by law and choice to eat the national bird—the eagle—the great choice of mankind is the turkey as an offering to the household gods on Thanksgiving Day, and

**Whereas** in an effort to carve it, there is many a man who will have to tear and hack a turkey apart because of poor, dull old carving tools;

### Therefore be it resolved

That every freeborn American, who is confronted with the necessity of carving on Thanksgiving Day, do inspect the carvers which he will have to use, and if they are in bad shape, that he obtain a new carving set from the store of the undersigned, that with good carvers a real joy may attach to carving and that Thanksgiving Day be rounded out in heartiest reality.

To which we attach the seal and signature of this firm.

JOHN DOE & CO.

141 Main Street,

Hardwaretown, Ill.

multitude of other articles which are seasonable at this period of the year. The Thanksgiving proclamation ad. reproduced herewith or something on this line may perhaps be used to advantage in this connection. This ad. may be used single column or double column as the merchant may prefer, and set up with due regard to style ought to prove effective.



# Hardware Associations:

## MANUFACTURERS, JOBBERs, RETAIL MERCHANTS.

*The trade will be interested in the list given below of the principal associations of Hardware manufacturers, jobbers and retail merchants with their officers. In the case of the retail associations it will be observed that particulars are given in regard to the time, place, &c., of their annual meetings:*

### American Hardware Manufacturers' Association:

President, Julius C. Birge, St. Louis, Mo.  
Vice-Presidents: Geo. W. Corbin, New Britain, Conn.; Henry B. Lupton, Pittsburgh, Pa.; C. W. Asbury, Philadelphia, Pa.  
Secretary-Treasurer, F. D. Mitchell, 300 Broadway, New York.

### Philadelphia Hardware Merchants and Manufacturers' Association:

President, Thomas Devlin.  
Vice-President, John R. Griffith.  
Secretary-Treasurer, T. James Fernley, 505 Commerce street, Philadelphia.

### National Hardware Association:

President, Samuel A. Bigelow, Boston, Mass.  
First Vice-President, John C. Koch, Milwaukee, Wis.  
Second Vice-President, Bruce Hayden, San Francisco, Cal.  
Secretary-Treasurer, T. James Fernley, 505 Commerce street, Philadelphia, Pa.

### Southern Hardware Jobbers' Association:

President, F. B. Dunlop, Fort Smith, Ark.  
First Vice-President, J. S. Warren, Memphis, Tenn.  
Second Vice-President, Frank S. Gray, Jacksonville, Fla.  
Secretary-Treasurer, C. B. Carter, Knoxville, Tenn.

### New England Iron and Hardware Association:

President, Charles F. Bragg, Bangor, Maine.  
Vice-President, William P. Hill, Boston, Mass.  
Treasurer, Charles H. Breck, Boston, Mass.  
Clerk, John T. Boyd, Boston, Mass.

### Pacific Coast Hardware and Metal Association:

President, Andrew Carrigan, San Francisco, Cal.  
First Vice-President, L. C. Scheller, Los Angeles, Cal.  
Second Vice-President, C. F. Prentiss, Sacramento, Cal.  
Treasurer, R. W. Kinney, San Francisco, Cal.  
Secretary, Eugene Goodwin, 132 Market street, San Francisco, Cal.

### National Heavy Hardware Jobbers' Association:

President, J. A. Gregg, St. Paul, Minn.  
Secretary-Treasurer, W. C. Brown, 184 La Salle street, Chicago, Ill.

### New York State Association of Hardware Jobbers:

President, J. H. Underwood, Binghamton.  
Vice-President, A. J. Lowery, Utica.  
Secretary-Treasurer, Joseph Born, Syracuse.

### Pennsylvania Wholesale Hardware and Supply Association:

President, H. L. Raub, Lancaster.  
First Vice-President, Geo. W. Lewis, Wilkes-Barre.  
Second Vice-President, A. B. Stein, Reading.  
Treasurer, Geo. D. Krause, Lebanon.  
Secretary, John Waelddin, Canton.

### Iowa Hardware Jobbers' Association:

President, F. E. Cutler, Waterloo.  
Vice-President, C. D. Scott, Dubuque.  
Secretary-Treasurer, T. E. Hurley, Des Moines.

### Texas Hardware Jobbers' Association:

President, James Moroney, Dallas.  
Secretary-Treasurer, R. F. Bell, Fort Worth.

### Arkansas Retail Hardware Association:

President, Thomas B. Stewart, Newport.  
First Vice-President, R. P. Allen, Van Buren.  
Second Vice-President, W. E. Dean, Portland.  
Secretary-Treasurer, C. E. Taylor, Little Rock.  
Annual meeting at Little Rock in June.

### California State Retail Hardware Association:

President, H. C. Bennett, San Francisco.  
First Vice-President, J. E. Janssen, Eureka.  
Second Vice-President, W. E. Devore, Ocean Park.  
Treasurer, George H. Smith, Oakland.  
Secretary, Henry Gracey, 235 Powell street, San Francisco.  
Annual meeting probably in March.

### Colorado Retail Hardware Association:

President, A. B. Meservey, Colorado Springs.  
Vice-President, Adolph Unfug, Walsenburg.  
Secretary-Treasurer, Davis Barkley, Fort Collins.  
Annual meeting at Denver. Date not yet decided.

### Connecticut Retail Hardware Association:

President, Chas. G. Agard, Torrington.  
First Vice-President, George J. Bassett, New Haven.  
Second Vice-President, Irving C. Treat, Hartford.  
Treasurer, Lewis B. Crosby, New London.  
Secretary, James De F. Phelps, Windsor Locks.  
Annual meeting at New Haven, February 27 and 28.

### Illinois Retail Hardware Association:

President, Frank B. McKenney, Rockford.  
Vice-President, F. Glessing, East St. Louis.  
Treasurer, George A. Englehardt, Chicago.  
Secretary, L. D. Nish, Elgin.  
Annual meeting at Chicago, February 20, 21 and 22; headquarters and exhibits at First Regiment Armory.

### Indiana Retail Hardware Association:

President, A. N. Shidler, South Bend.  
First Vice-President, Chas. Frame, North Manchester.  
Second Vice-President, Walter B. Creed, New Albany.  
Secretary-Treasurer, M. L. Corey, Argos.  
Annual meeting at Indianapolis, February 13, 14 and 15; headquarters and exhibits at Tomlinson Hall.

### Inland Empire Implement and Hardware Dealers' Association:

President, C. L. Butterfield, Moscow, Idaho.  
First Vice-President, E. E. Lucas, Davenport, Wash.  
Second Vice-President, Dana Child, Spokane, Wash.  
Treasurer, J. A. Fridaker, Spokane, Wash.  
Secretary, E. W. Evenson, Spokane, Wash.  
Annual meeting at Spokane, January 10, 11 and 12.

### Iowa Retail Hardware Association:

President, H. S. Vincent, Fort Dodge.  
Vice-President, C. E. Haas, Le Mars.  
Secretary-Treasurer, A. R. Sale, Mason City.  
Annual meeting at Des Moines, February 14, 15 and 16.

### Kentucky Retail Hardware and Stove Dealers' Association:

President, J. C. Frederick, Owensboro.  
First Vice-President, U. S. Shacklett, Fulton.  
Second Vice-President, George W. Buck, Louisville.  
Treasurer, A. Steltier, Jr., Owensboro.  
Secretary, John R. Sower, Frankfort.  
Annual meeting at Louisville, February 13, 14 and 15; headquarters at Galt House.

### Michigan Retail Hardware Association:

President, J. H. Whitney, Merrill.  
Vice-President, George B. M. Towner, Muskegon.  
Treasurer, Henry C. Weber, Detroit.  
Secretary, A. J. Scott, Marine City.  
Annual meeting at Detroit, August 8 and 9.

### Minnesota Retail Hardware Association:

President, A. T. Stebbins, Rochester.  
Vice-President, George M. Evenson, St. Peter.  
Treasurer, G. F. Duerre, Plain View.  
Secretary, M. S. Mathews, Boston Block, Minneapolis.  
Annual meeting at Minneapolis late in February; dates not yet determined.

### Missouri Retail Hardware and Stove Dealers' Association:

President, Taylor Frier, Louisiana.  
Vice-President, Wm. H. Hahn, St. Louis.  
Secretary-Treasurer, Frederick Neudorff, St. Joseph.  
Time and place of annual meeting not yet determined.

### National Retail Hardware Association:

President, W. P. Bogardus, Mt. Vernon, Ohio.  
First Vice-President, E. M. Bush, Evansville, Ind.  
Second Vice-President, H. F. Emery, Fargo, N. D.  
Secretary-Treasurer, M. L. Corey, Argos, Ind.  
Annual meeting at Chicago; dates not yet determined.

### Nebraska Retail Hardware Association:

President, Max Uhlig, Holdrege.  
First Vice-President, Albert Degner, Norfolk.  
Second Vice-President, Frank Haecker, Friend.  
Third Vice-President, M. A. Hagleroad, Holstein.  
Treasurer, H. J. Hall, Lincoln.  
Secretary, Frank K. Barr, Lincoln.  
Annual meeting at Lincoln, February 13, 14 and 15.

### New England Retail Hardware Association:

President, J. B. Hunter, Boston.  
First Vice-President, H. P. King, Portland, Maine.  
Second Vice-President, S. H. Thompson, Lowell, Mass.  
Treasurer, Henry M. Sanders, Boston.  
Secretary, F. Alex. Chandler, Chandler & Farquhar Company, Boston.  
Annual meeting at Boston; dates not yet determined.

### New York State Association of Retail Hardware Dealers:

President, C. P. Sherwood, White Plains.  
First Vice-President, Louis J. Ernst, Rochester.  
Second Vice-President, L. G. Mattison, Newark.  
Treasurer, F. E. Pelton, Herkimer.  
Secretary, J. B. Foley, Syracuse.  
Annual meeting at Binghamton, February 20, 21 and 22.

### North Dakota Retail Hardware Association:

President, H. F. Emery, Fargo.  
First Vice-President, Martin Jacobson, Minot.  
Second Vice-President, H. H. Walther, Casselton.  
Third Vice-President, O. I. Butler, Clifford.  
Treasurer, H. T. Helgesen, Milton.  
Secretary, C. N. Barnes, Grand Forks.  
Annual meeting at Grand Forks, January 30 and 31.

### Ohio Hardware Association:

President, John F. Baker, Dayton.  
Vice-President, C. S. Johnson, Barborton.  
Financial Secretary, A. L. Shearer, Dayton.  
Treasurer, L. F. Stahler, Waverly.  
Corresponding Secretary, Frank A. Bare, Mansfield.  
Annual meeting at Canton, February 27 and 28 and March 1; headquarters and exhibits at Auditorium Building.

**Oklahoma and Indian Territory Retail Hardware, Implement and Vehicle Dealers' Association:**  
 President, A. L. Severance, Durant, I. T.  
 First Vice-President, George W. Mowbray, Tulsa, I. T.  
 Second Vice-President, W. J. Pettie, Oklahoma City, O. T.  
 Treasurer, S. R. Frazee, Vinita, I. T.  
 Secretary, W. G. Johnson, Oklahoma City, O. T.  
 Annual meeting at Oklahoma City, O. T., July 10.

**Pennsylvania Retail Hardware Association:**  
 President, Joseph M. Selheimer, Lewistown.  
 Vice-President, George V. Thompson, Mt. Jewett.  
 Secretary-Treasurer, J. E. Digby, McKees Rocks.  
 Annual meeting at Williamsport, February 7, 8 and 9.

**Rhode Island Retail Hardware Association:**  
 President, E. A. Loomis, Providence.  
 Vice-President, W. A. Bosworth, Providence.  
 Treasurer, C. H. Angell, Providence.  
 Secretary, F. T. Kelley, Providence.  
 Annual meeting at Providence, probably in June.

**South Carolina Retail Hardware Association:**  
 President, H. B. Duvall, Cheraw.  
 First Vice-President, M. O. Dantaler, Orangeburg.  
 Second Vice-President, J. O. Flower, Rockhill.  
 Secretary-Treasurer, Paul W. McLure, Greenwood.  
 Annual meeting at Columbia, Wright's Hotel, second Tuesday in June.

**Texas Retail Hardware and Implement Association:**  
 President, S. L. Erwin, Honey Grove.  
 Vice-President, R. L. Penick, Stamford.  
 Secretary-Treasurer, J. W. McManus, Waxahachie.  
 Annual meeting at Dallas, January 23, 24 and 25.

**Washington Retail Hardware Association:**  
 President, F. A. Ernst, Seattle.  
 Vice-President, H. W. Myers, Tacoma.  
 Treasurer, H. D. Cowles, Tacoma.  
 Secretary, N. H. Thedinga, Seattle.  
 Assistant Secretary, C. A. Taber, Seattle.  
 Annual meeting at Seattle, November 15 and 16.

**Wisconsin Retail Hardware Association:**  
 President, Ralph Burtis, Oshkosh.  
 Vice-President, E. Tietjen, Manitowoc.  
 Secretary-Treasurer, C. A. Peck, Berlin.  
 Annual meeting at Milwaukee, February 7 and 8; headquarters and exhibits at West Side Turn Hall.

## SCREEN SELLING COMPANY FORMED.

THE Continental Company, with general offices in the Penobscot Building, Detroit, Mich., has been incorporated under the laws of the State of Michigan, and will act as direct representative of the following manufacturers of Screen Goods:

Owosso Mfg. Company, Owosso, Mich.  
 Wabash Screen Door Company, Minneapolis, Minn.  
 Wabash Screen Door Company, Memphis, Tenn.  
 Porter Screen Mfg. Company, Burlington, Vt.  
 A. J. Phillips Company, Fenton, Mich.  
 Philadelphia Screen Mfg. Company, Philadelphia, Pa.  
 Queen Anne Screen Company, Burlington, Vt.

A. M. Bentley has been chosen president of the company and W. B. Phillips manager.

### Overproduction.

For two or three years the screen manufacturers have been urged by the jobbers to effect some kind of an organization or to co-operate in some manner to improve the general condition. There has been a capacity for overproduction of screen doors and window screens of nearly 40 per cent. for the past year or so, and this has resulted in such indiscriminate cutting of prices that even the strongest and best manufacturers have actually operated their plants at a loss.

The manufacture of window screens and screen doors is a business in which it is impossible to obtain anything like a monopoly, for the reason that it is an easy business to get into. It is, therefore, the desire of the factories to make

### Their Prices as Low as Possible

so as to discourage new competition. On the other hand there would be little object in co-operation unless there could be some improvement in the earnings of the different factories. In one regard the factories are badly handicapped and that is the advance in the cost of lumber. During the past year the lumber for a dozen screen doors is said to have advanced from over \$1 per dozen for the common screen doors to considerably more than that amount for the fancy patterns—that is, there has been an advance of more than \$10 per thousand in screen door

lumber and suitable lumber is so scarce as to be almost unobtainable at the present time.

### Net Prices.

The Continental Company will introduce a system of making a net price for each size of screen doors. The base door will be the 2 foot 6 inch by 6 foot 6 inch size. In the past, screen doors of all regular stock sizes have been sold at the same price, notwithstanding that there is understood to be a difference in the bare cost of materials and labor of 91 cents per dozen between the 2 foot 6 inch by 6 foot 6 inch and the 3 by 7 foot sizes of common screen doors.

The use of lists and discounts on window screens and window screen frames will also be abandoned and net prices made on each size of each pattern.

### Brief Outline of Policy.

As outlining the policy of the company the following announcement made by it will be of interest:

It is believed that the handling of the product of the several factories, whose names appear on the title page, and the consequent co-operation of the various interests will result in improved conditions for all the trade.

The policy is to be broad and liberal and the aim is to make the organization permanent.

The purpose is to make prices which, while enabling these modern factories to make moderate earnings, will yet be so low as to discourage demoralizing competition.

It was expected that prices would be ready by November 1, but a complete and careful revision of factory costs as well as important changes in the method of quoting prices and delay in the publication of catalogues will necessitate a delay of a few days, possibly until on or about November 10. Quotations will then be sent to the former customers of each factory, and a representative of this agency will call as soon as possible in all territory where factories have heretofore been represented.

It is desirable to retain for each factory its former customers, and while this agency has no purpose of attempting to dictate in such matters and will most cheerfully accept specifications for any of the factories, it is hoped that patrons will co-operate with the Continental Company in the equitable distribution of business among the factories. This will be of mutual benefit, as an oversold factory cannot well give the best service.

It is, however, apparent that this agency can aid in giving better service to the trade, since if a factory becomes oversold another of the factories can, no doubt, at once relieve the situation with goods which will become standardized as the agency becomes older. Economies in freight can also sometimes be effected through the widely distributed locations of our factories.

One of the strongest reasons for organizing this agency was the oft-repeated request of jobbers all over the United States.

While this agency cannot guarantee profits to its jobbing friends, and is at present unable to adopt "restricted prices" to the retail trade, it will use its best efforts to prevent price cutting, and expects to be in a position to aid in the maintenance of prices and will co-operate with the jobbing trade to that end. It will also co-operate with jobbers who are not patrons of this agency in all matters for the general betterment of the trade.

The Continental Company will make quotations and prices and will make arrangements with jobbers for the sale of the product of the various factories and will also handle the accounts. It is provided, however, that the customers may send their specifications direct to the several factories in order to secure prompt service.

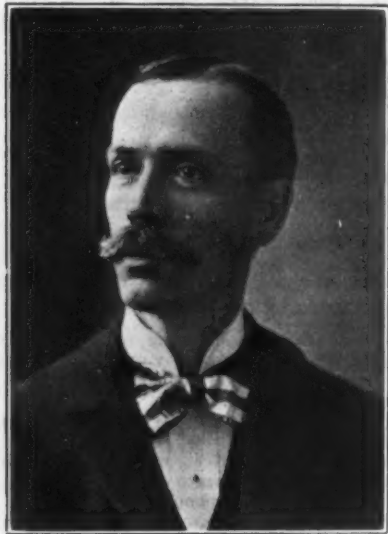
THE BUFFALO WHOLESALE HARDWARE COMPANY, Buffalo, N. Y., has just issued a fall and winter catalogue of 130 pages. The company states that there is no attempt to show its complete line, but only those goods which customers would presumably wish to stock up with in preparation for the season's trade, remembering that "there is no profit on lines you are out of." Accompanying the catalogue there is a comprehensive price-list. Besides a view of the company's building the book contains a group picture of the traveling salesmen, with full information regarding terms, claims, mail orders, back orders and returned goods. Although the business is only three years old the company expresses the belief that it is a pretty well developed child and that it can serve the trade in a most expeditious and satisfactory way.

Henry T. Brown, Ludlow, Vt., has bought the interest of Frank Howard in the Hardware business operated under the style of Howard & Brown and will continue under his own name.



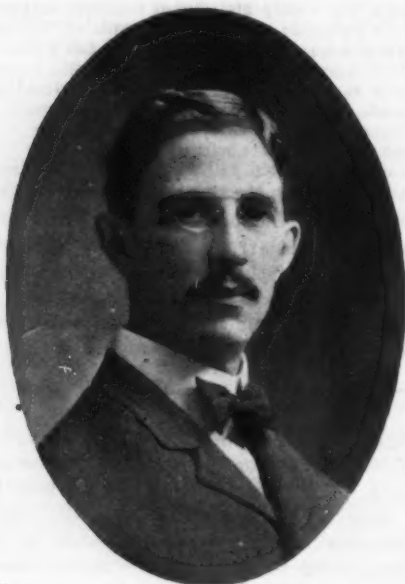
## NEW YORK STATE JOBBERS' ASSOCIATION.

AS already announced the New York State Association of Hardware Jobbers at its recent annual meeting elected J. H. Underwood president and A. J. Lowery vice-president, Joseph Born of Syracuse being re-elected



J. H. UNDERWOOD, President.

secretary-treasurer. As new officers we present portraits of Messrs. Underwood and Lowery herewith. The former is a member of the firm of Babcock, Hinds & Underwood of Binghamton, while Mr. Lowery is secretary and treasurer of Wright-Dana Hardware Company of Utica. This association, which is one of the oldest jobbing organizations of the country, comprises the following houses: J. M. Warren & Co., Troy; Albany Hardware & Iron Company, Albany; Wright-Dana Hard-



ARTHUR J. LOWERY, Vice-President.

ware Company, Chas. Miller & Son Company and Roberts Hardware Company of Utica; Burhans & Black Company of Syracuse, Babcock, Hinds & Underwood of Binghamton, Barker, Rose & Clinton Company and Irving D. Booth of Elmira, Mathews & Boucher and Weaver, Palmer & Richmond of Rochester, Weed & Co., Sidney Shepard & Co. and Buffalo Wholesale Hardware Company of Buffalo, J. T. Johnston of Kingston, W. W. Conde Hardware Company of Watertown, Treman, King & Co. of Ithaca, and Phelps, Lewis & Bennett Company of Wilkesbarre, Pa.

## DEATH OF DAVID H. JAMES.

DAVID H. JAMES, for many years president of the Central Stamping Company, New York, died at his home in Northport, L. I., Saturday morning, November 4, aged 71 years. Mr. James had not been actively connected with the business of the company, of which he was a director until his death, for about seven years, and he had been in poor health for the past two or three years, which necessitated his spending the winters in a warmer climate.

Mr. James was born in Central New York in 1835 and was educated at a well-known academy in Brockport, N. Y. He came to New York in the spring of 1852 and became a clerk with his uncle, N. E. James, to which business he was admitted as a partner a few years later. After his uncle's death the house became James, Alkman & Co., in 1868, Walter M. Alkman being the senior partner; but to avoid the appearance of too much change, the business of N. E. James being well known, it was decided to keep the old name still at the head. When the Central Stamping Company was organized January 1, 1885, comprising the entire interests of James, Alkman & Co., E. Ketcham & Co., F. Haberman and portions of the interests of the Lalance & Grosjean Mfg. Company and the St. Louis Stamping Company, Mr. James became president and so continued for 10 years. Mr. James was of a genial disposition and popular socially, but took no prominent part in politics or public life. He is survived by a widow.

## CONNECTICUT HARDWARE ASSOCIATION.

THE directors of the Connecticut Hardware Association met at Hartford on the 31st ult. and voted to hold the next annual convention at New Haven, February 27 and 28. This, it is expected, will prove to be the banner meeting of the association. An extra effort will be made to enroll in the membership as many as possible of the nonaffiliated Hardware merchants of the State before the convention. The presence of manufacturers and their representatives will be especially welcome at the meeting. George J. Bassett of New Haven, first vice-president of the association, has been appointed chairman of the committee of arrangements, which will doubtless provide a programme of exceptional interest. James De F. Phelps of Windsor Locks is secretary of the association.

## BROWN &amp; SHARPE MFG. COMPANY'S CATALOGUE.

BROWN & SHARPE MFG. COMPANY, Providence, R. I., has recently issued a new catalogue, No. 107, covering its well-known line of Machinists' Tools. A colored insert calls special attention to the new Tools which have been added during the past year, comprising tempered steel Hook Rules, tool makers' Knife Edge Straight Edges, "B. & S." single and double point Scribes, tool makers' Clamps, automatic Center Punches, tool makers' Callipers and Dividers, Universal Dividers, No. 856, improved steel Beam Trammels, No. 852, Micrometer Callipers, Nos. 4-A and 5-A, inside Micrometer Callipers, English or metric system Micrometer Caliper Sets, Dial Test Indicator, Universal Surface Gauges and ground Flat Stock. Besides the illustrations, descriptions and price-lists of the complete line of Tools, the catalogue contains much general information in the way of historical matter, definitions of terms and tables of value to mechanics.

CONTRACT for the erection of the new building for the Standart-Simmons Hardware Company at Toledo, Ohio, has been let to H. J. Spieker of that city. The contract includes everything except heating, lighting, plumbing and the installation of two elevators, plans on which have not been decided. The building will be a seven-story structure, 185 x 150 feet, and will cost \$150,000.

W. L. Biggs, Westfield, Ill., has sold out his stock of Hardware and Implements.

A PRACTICAL METHOD OF TAKING IN-  
VENTORY.

**A** PRACTICAL method of taking the annual inventory in a retail Hardware store is used by H. Newell & Co., Shelburne Falls, Mass., who have found it well adapted to their use. The system is simple and convenient, and will undoubtedly be of interest to merchants who are seeking improvement in this direction.

The Blanks Employed.

are made of ordinary Manila Wrapping Paper cut in strips 6 inches wide and 24 inches long, ruled, as shown

Storehouse No. 1 Room 2					
Agricultural Tools For'd					
	Yankee Plows			533	94
1	#10	6	63		
2	#24	2.40	15	80	
1	#34		10	15	35 58
Syracuse Plows					
2	A.	7.50	15	00	
1	B.		7	00	22 00
Miscellaneous					
1	Landside Plow #2 V. cost 5.60		5	00	
1	Cut. Beam		1	31	
1	Is		1	25	
1	Set pole trimmings		1	90	
1	Hallook Potato Digger		15	35	
5	Phos. Droppers	1.50	9	00	33 81
3 1/2	Dry. Fire Pails V cost 24.00 dy. called			15	00
American Fencing					
90	rods #8 1/2	23.65	21	20	
15	" 9 3/8	27.12	4	07	
40	" 10 1/4	35.00	14	00	
50	" 12 1/4	32.67	16	33	
40	" 12 1/2	37.00	14	80	
20	" 15 1/2	23.50	4	70	75 10
Barb Wire					
50 50	lbs Hankigan reg.	256 cut	211	50	
59 33	" Waltham	226 "	201	58	412 58
Total - Agl dept.				1128	47
Iron Pipe					
318	ft 1/4 in Black	207	4	35	
640 1/2	" 1/2 "	265	18	36	
352	" 3/4 "	349	1	25	
19 1/2	" 1 1/4 "	740	14	42	
50 1/2	" 2 "	952	5	76	
127					

Reproduction of Inventory Sheet.—Actual Size, 6 x 24 Inches.

In the accompanying illustration. If desired, sufficient Paper to last for several years could be ruled and cut to order at moderate expense.

Early in December

the work of getting up the inventory is begun by going over, at odd times, goods then out of season, such as Hay Forks, Screen Doors, Lawn Mowers, &c., using a separate blank to enter up each kind of goods. The sheets remain with the goods, and should any article be sold before the time taking of the complete inventory a memorandum is left so that the sheet can immediately be made to show the stock on hand. The last of December when stock taking begins in earnest the force goes through the store systematically, entering up all goods in the order of their location, and the sheets and memoranda previously made are collected. Goods are grouped in departments, as well as by name and brand, a separate line of the sheet being devoted to each subheading. The top line of a sheet indicates the location of the goods listed thereon, as "Storehouse No. 1, Room 2," in the illustration.

Getting the Figures.

In pricing the stock the value of each item is extended in the first column of the blank and the total of the kind is carried to the second column. The total of a department is footed and inclosed in double lines, as, for instance, "Total, Agricultural Department," as shown on the sheet reproduced. Should any article be found damaged or for any cause be worth less than cost a check mark is entered against it and a price is affixed which it is believed will dispose of it, as shown several times on the sheet. The actual cost is also entered, however, so that it may be kept in mind when making a sale. Proprietors and clerks have a memorandum of these items constantly before them until the goods are closed out.

After the Goods Are on Paper

the sheets are bound together with Hardware twine, through the perforations at the top, and numbered with a numbering machine, the first sheet being blank for use as an index. This makes it possible to find any department or block of goods immediately if it is desired for reference. The total of each department is carried into a small private book in which are entered all other details necessary to complete the inventory.

In connection with stock taking the firm has an excellent method of

Keeping Track of Yearly Purchases

of all lines or blocks of goods of any importance. Take Screws, for example: In a journal devoted to this purpose the quantity on hand, as shown by inventory, is entered in red ink, subsequent purchases in black. With this data it is an easy matter to determine the exact number of Screws sold of any kind or size. The figures are regularly gone over and the percentage which each size bears to the total sales for a year or series of years. For instance, it appears that 5 per cent. of all the flat head bright Screws sold are 3/4 inch No. 8. Ten years ago this size averaged 4.6 per cent. These ratios are carefully worked out and entered in the journal in red ink, affording ready information which is obviously of great value in placing stock orders.

MERCHANTS FORM AN IMPLEMENT  
MANUFACTURING COMPANY.

**I**MPLEMENT dealers in the Mississippi Valley are reported to have organized the Mutual Mfg. Company, and Neosho, Mo., has been chosen as the location for a plant. The city has offered \$10,000 in cash and the choice of two sites, one containing 15 and the other 80 acres. The company is composed of merchants subscribing for \$1000 worth of stock. It is proposed to sell the output of the factory to the stockholders, the object being to eliminate the cost of selling and other expense, which will make prices low enough to compete with the lowest prices of catalogue houses. It is stated that new subscriptions for stock are coming in daily and that by the first of the year the stockholders will number from 200 to 250. The following officers have been elected: President, E. R. Moses, Great Bend, Kan.; vice-president, J. F. Steele, Parsons, Kan.; secretary, F. S. Briggs, Neosho, Mo.; treasurer, Ed Haas, Neosho, Mo.; general manager, F. E. Montee, formerly of Kansas City; superintendent, R. H. Savage, formerly of Davenport, Iowa.

**THE NOVEMBER**, or so-called Santa Claus, edition of "Our Drummer," the catalogue of Butler Bros., New York, is now being circulated. It is embellished by an attractive cover and, as would be expected, Christmas goods are featured to a considerable extent, although not to the exclusion of staple and seasonable lines. In addition to its catalogue matter the book gives a call to merchants to make the most of their opportunity, referring with enthusiasm to the widespread prosperity which should make the current season a record breaker in volume of business. There are many valuable suggestions for holiday merchandising, together with practical hints to buyers, which may be read with advantage and profit.



## FACTORY COST AND BUSINESS METHODS.

### COST SYSTEM OF THE BILLINGS & SPENCER COMPANY, HARTFORD, CONN.

In the first article of this series, which was published last week, a description of the system followed in the Machine Department was commenced, illustrations being given of the workmen's weekly and job tickets and stock memorandum. The description of the Machine Department system is concluded in the second article, which follows:

#### Second Article.

IN a large department, employing more than 100 men, for instance (and the same thing is true to a more limited extent in a smaller department), it is necessary to avoid confusion in the use of the time recorder during the few moments when the men are registering in or out at the beginning or end of each half day. This is accomplished by the

#### Arrangement of the Anteroom

of the foreman's office, shown in Fig. 5, where the time clock is located. The men must always enter and leave the anteroom through the one shop door. Of course, the arrangement of this room and its general location as regards the shop itself might in other cases make possible one door for the entrance and another for the exit of the workmen, but here a single door must do for both.

On the walls of this room are four racks, each having receptacles numbered from one up to the limit of men employed in the department. These racks are in pairs, A and B and C and D. When the workman is out of the shop both his weekly and his job tickets

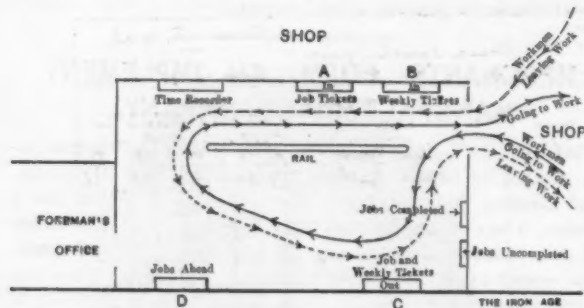


Fig. 5.—Plan of Ante-Room showing Course of Workmen in Going to or Leaving Work.

are deposited under his number in rack C, entitled "Job and weekly tickets out." When he goes to work he takes these two tickets from the rack, passes to the time recorder, and, after registering them "in," deposits them, one in the job ticket rack A, the other in the weekly ticket rack B, which are side by side. The reason for having two racks instead of the one is that there may be no mistake in stamping the weekly time ticket for the job ticket, which would be liable to happen among the more ignorant classes of workmen. One workman may handle a dozen job tickets in a day, while he has but one time ticket for the entire week. The course taken by the man in leaving work is past the racks A and B, from which he takes his two tickets, stamps them "out" on the time recorder, passes to the rack C and deposits them in the receptacle bearing his number. The direction of his passage through the anteroom is guided by the rail, which is put there so that the men will pass in line, a necessary precaution because the single door answers for both entrance and exit. When the workman returns to the shop for his next half day his trip through the anteroom is in a course opposite to that of his leaving work, for he must first

go to rack C, take from it his time and job tickets, register them "in" on the time recorder and replace them in racks A and B, there to remain, the weekly ticket for the remainder of the half day, the job ticket for the same time or until the job shall be completed during that period.

The rack in which the time and job tickets are deposited while the workmen are out of the shop is a conspicuous reminder to the foreman and his clerk of what men are absent from work. Their time and job tickets show prominently in the almost empty rack, and it is an easy matter to go through the cards of the absent ones and see to it that work which should be done immediately is attended to by other workmen.

#### The "Jobs Ahead" Rack,

indicated in the diagram as D, is an important part of the system. In it are placed job tickets for work to be done, each ticket against an employee's number, so that

Machine Department Weekly Balance Sheet.						
Workman's No. 123		Name John Johnson		Week ending Jan 14.		
Date	Production.		Non-Production.		Total of Job Tickets.	Wages.
	Order No.	Amount.	Order No.	Amount.		
Jan 9	C-1192	68				68
Jan 10	C-1193			2 15		2 15
Jan 11	B-101			2 10		2 10
Jan 12	C-1260	1				2 10

Fig. 6.—Workman's Weekly Balance Sheet.

when a man's job is completed he does not have to seek the foreman, but instead goes to the "Jobs ahead" rack and takes the ticket against his number. This rack is used in conjunction with another in the foreman's office, in which are laid out tickets for jobs ahead, in the order in which they should be attended to. Thus work may be prepared for a full week or even longer, so that even in the absence of the foreman the work of the department will go along smoothly and economically, the foreman's judgment as to the selection of workmen for the various jobs acting as well in his absence as when he is present in the shop. As fast as the workmen remove job tickets from the "jobs ahead" rack in the anteroom, the clerk fills the empty spaces with tickets for the next jobs to be performed.

#### For the Sake of Illustration

suppose that workman 12 B has completed a job of centering six base dowel pins. He enters the anteroom, takes from his number in the "jobs ahead" rack the ticket of his next job—to square the same six base dowel pins—takes the two tickets to the time recorder and stamps them both, one in the "out" column, the other in the "in" column. The ticket of the completed job he drops in a box with slotted cover. There are two of these boxes, one for completed jobs, the other for uncompleted jobs, for use where a workman has been interrupted in one job by order of the foreman, perhaps, that more urgent work may be done, or because a machine has broken down or for some other reason. This latter box is frequently examined by the clerk, the cards being removed and again placed in the "jobs ahead" rack, either in the anteroom or in the foreman's office.

#### The Completed Job Tickets

from the box into which they have been dropped, are distributed by the clerk in a rack in the foreman's office, each under the number of the employee who did the work. At the end of each week all uncompleted job tickets are collected and distributed likewise, new tickets being made out for those jobs and placed in the "Jobs Ahead" rack in the anteroom ready for the men when they begin work on Monday morning. The records of all job tickets of the week are transferred to the weekly balance sheet shown in Fig. 6, the transfers being in







**Combination Knife, File and Nail Cleaner.**

A combination pen knife, file and nail cleaner is being placed on the market by the Billings & Spencer

by having either the bottom or the top sash open or both. The dotted lines in the illustration indicate the position of the swinging leaf when the sashes are to pass so that the window will be wide open. In places where articles



Fig. 1.—Sectional View of Tool Closed.



Fig. 2.—Knife Blade in Position for Use.



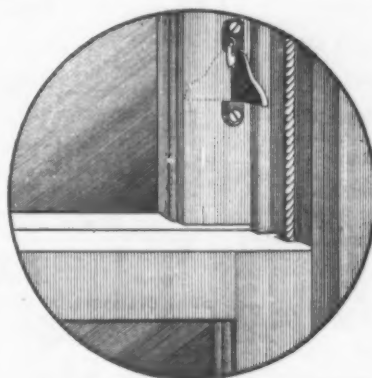
Fig. 3.—File and Nail Cleaner in Position for Use.

Company, Hartford, Conn. The knife and file are fastened end to end, and slide back and forth within the hollow handle, which is made of steel tubing. The blades are shifted to either end by means of the sliding bolt in the center which passes through a slot running the length of the handle, and locks each blade at its respective end. The blades are of fine steel, the handle is knurled, and the whole is nicely finished and nickel plated. The illustrations show the exact size of the tool, which can be carried in the vest pocket, making a very compact and useful companion.

in the room can be reached from the outside through the lower window another lock may be placed on the casing

**The Cannon Ventilating Window Lock.**

The Cannon Mfg. Company, 388 La Salle avenue, Chicago, Ill., is offering the ventilating window lock shown herewith. It is made of malleable iron and has a swinging leaf to allow the sashes to pass each other when the lock is not in use. The lock is secured in its open or closed position by a safety catch. It is screwed on to the right hand side of the upper sash about 5 or 6 inches from the bottom of the sash, thus permitting ventilation



The Cannon Ventilating Window Lock.

or molding just over the top of the lower sash, thus permitting the locking of the lower sash independently of the upper one.

**PAINTS, OILS AND COLORS****Animal, Fish and Vegetable Oils—**

Linseed, City, raw.....	42	@43
Linseed, City, Boiled.....	43	@44
Linseed, State and West'n, raw.....	40	@41
Linseed, raw Calcutta seed.....	42	@43
Lard, Extra Prime, Winter.....	60	@61
Lard, Extra No. 1.....	50	@51
Lard, No. 1.....	37	@38
Cotton-seed, Crude, f.o.b. mills.....	20 1/2	@21
Cotton-seed, Summer Yellow.....	28	@29
Prime.....	28	@29
Cotton-seed, Summer Yellow.....	28	@29
off grades.....	28	@29
Sperm, Crude.....	50	@51
Sperm, Natural Spring.....	50	@51
Sperm, Bleached Spring.....	50	@51
Sperm, Natural Winter.....	60	@61
Sperm, Bleached Winter.....	60	@61
Tallow, Prime.....	51	@52
Whale, Crude.....	42	@43
Whale, Natural Winter.....	42	@43
Whale, Bleached Winter.....	42	@43
Menhaden, Brown, Strained.....	27	@28
Menhaden, Light, Strained.....	28	@29
Menhaden, Bleached, Winter.....	30	@31
Menhaden, Ex. Bid., Winter.....	31	@32
Menhaden, Southern.....	18	@19
Keelhead, Ceylon.....	8	@9
Cocconut, Cochlan.....	8	@9
Cod, Domestic, Prime.....	34	@35
Cod, Newfoundland.....	30	@31
Red, Elaine.....	29	@30
Red, Saponified.....	14	@15
Oilre, Italian, bbls.....	58	@59
Neatsfoot, prime.....	49	@50
Palm, Logos.....	10	@11

**Mineral Oils—**

Black, 20 gravity, 25@30 cold.....	10 1/2	@11 1/2
Black, 20 gravity, 15 cold test.....	11 1/2	@12 1/2
Black, Summer.....	10 1/2	@11 1/2
Cylinder, light filtered.....	18	@19
Cylinder, dark filtered.....	16	@17
Paraffine, 900-907 gravity.....	12 1/2	@13 1/2
Paraffine, 903 gravity.....	11 1/2	@12 1/2
Paraffine, 883 gravity.....	9 1/2	@10 1/2
Paraffine, Red.....	11 1/2	@12 1/2
In small lots 1/4¢ advance.		

**Miscellaneous—**

Barytes, White, Foreign.....	17 50	@18 00
Barytes, Amer. floated.....	18 00	@19 00
Barytes, off color, No. 2.....	13 50	@15 00
Chalk, in bulk.....	3 00	@3 25
Chalk, in bbls.....	100 lb	@3 35
China Clay, English.....	11 00	@12 00
Cobalt, Oxide.....	100 lb	2 50 @ 2 60
Whiting, Common.....	100 lb	.45 @ .48
Whiting, Gilders.....	100 lb	.50 @ .55
Whiting, Ex. Gilders.....	100 lb	.55 @ .60

**Putty, Commercial—**

In bladders.....	\$1.65	@1.85
In bbls or tubes.....	1.15	@1.35
In 1 lb to 5 lb cans.....	2.00	@2.50
In 12 1/2 to 50 lb cans.....	1.45	@1.85

**Spirits Turpentine—**

In Oil bbls.....	71 1/2	@72 1/2
In machine bbls.....	72	@73 1/2

**Glue—**

Cabinet.....	11	@15
Common Bone.....	7	@9
Extra White.....	16	@24
Foot Stock, White.....	11	@14
Foot Stock, Brown.....	12	@15
German Hide.....	12	@15
French.....	10	@14
Irish.....	13	@16
Low Grade.....	9	@12
Medium White.....	14	@17

**Gum Shellac—**

Bleached Commercial.....	36	@37
Bone Dried.....	46	@47
Button.....	36	@45
Diamond I.....	45	@55
Fine Orange.....	45	@47
A. C. Garnet.....	44	@44
D. C.....	60	@60
Octagon B.....	40	@42
T. N.....	40	@41
V. S. O.....	58	@58

**Colors in Oil—**

Black Lampblack.....	12	@14
Black, Chinese.....	3	@46
Blue, Prussian.....	32	@32

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	11	@14
Green, Chrome.....	10	@15
Green, Paris.....	10	@21
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

**White Lead, Zinc, &c.—**

Lead, English white, in Oil.....	8 1/2	@9 1/2
Lead, American white, in Oil.....	7	@7 1/2
Lots of 500 lb or over.....	6 1/2	@7
Lots less than 500 lb.....	7	@7 1/2
In Barrels.....	6	@6 1/2
Lead, White, in oil, 25 lb tin.....	1 1/2	@1 1/2
Lead, White, in oil, 12 1/2 lb tin.....	1 1/2	@1 1/2
Lead, White, in oil, 1 to 5 lb.....	1	@1
Lead, White, in oil, 1 to 5 lb.....	1 1/2	@1 1/2
Lead, American, Terms: For lots 12 tons and over 1/4¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.....	10	@10 1/2
Lead, White, Dry in bbls.....	6	@6 1/2
Zinc, American, dry.....	14	@14 1/2
Paris, Red Seal, dry.....	9 1/2	@10 1/2
Paris, Green Seal, dry.....	10 1/2	@11 1/2
Antwerp, Red Seal, dry.....	8 1/2	@9 1/2
Antwerp, Green Seal, dry.....	10	@10 1/2
Zinc, V. M. French, in Poppy Oil.....	10	@10 1/2
Green Seal.....	10	@10 1/2
Lots of 1 ton and over.....	12 1/2	@13 1/2
Lots of less than 1 ton.....	13 1/2	@14 1/2
Zinc, V. M. French, in Poppy Oil.....	10	@10 1/2
Red Seal.....	10	@10 1/2
Lots of 1 ton and over.....	11 1/2	@12 1/2
Lots of less than 1 ton.....	12 1/2	@13 1/2
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.		

**Dry Colors—**

Black, Carbon.....	5	@10
Black, Drop, American.....	4	@6
Black, Drop, English.....	5	@15

Black, Ivory.....	16	@20
Lamp, Com.....	4 1/2	@5
Blue, Cassin.....	4	@5
Blue, Chinese.....	27	@30
Blue, Prussian.....	4 1/2	@5
Blue, Ultramarine.....	15	@15
Brown, Spanish.....	1 1/2	@1 1/2
Carmine, No. 40.....	3 50	@3 60
Green, Chrome, ordinary.....	3 1/2	@6
Green, Chrome, pure.....	17	@25
Lead, Red, bbls., 1/2 bbls. and kegs:		
Lots 500 lb. or over.....	6 1/2	@7
Lots less than 500 lb.....	7	@7 1/2
Litharge, American, bbls.....	6	@6 1/2
Ocher, American.....	10	@10 1/2
Ocher, American Golden.....	2 1/2	@3 1/2
Ocher, French.....	1 1/2	@2 1/2
Ocher, Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
Orange Mineral, French.....	10 1/2	@12 1/2
Orange Mineral, German.....	8 1/2	@10 1/2
Orange Mineral, American.....	8 1/2	@10 1/2
Red, Indian, English.....	4 1/2	@5 1/2
Red, Indian, American.....	3	@3 1/2
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100 lb	\$0.50 @ \$1.25
Red, Venetian, English.....	100 lb	\$1.15 @ \$1.75
Sienna, Italian, Burnt and Powdered.....	3	@9 1/2
Sienna, Ital., Raw Powd.....	3	@6 1/2
Sienna, American, Raw.....	1 1/2	@2
Sienna, American, Burnt and Powdered.....	1 1/2	@2
Talc, French.....	14	@2
Talc, American.....	10	@10 1/2
Terra Alba, French.....	100 lb	\$0.90 @ \$1.00
Terra Alba, English.....	100 lb	\$0.90 @ \$1.00
Terra Alba, American.....	100	@100
White, No. 1.....	60	@70
Terra Alba, American.....	100	@100
White, No. 2.....	14	@20
Umber, Turkey, Bnt. & Pow.....	2 1/2	@3 1/2
Umber, Turkey, Raw & Pow.....	2 1/2	@3 1/2
Umber, Burnt, Amer.....	1 1/2	@2 1/2
Umber, Raw, Amer.....	1 1/2	@2 1/2
Yellow, Chrome.....	11	@11 1/2
Vermilion, American Lead.....	10	@25
Vermilion, Quicksilver, bbls.....	6	@65
Vermilion, Quicksilver, bags.....	6	@65
Vermilion, English, Import.....	75	@80
Vermilion, Chinese.....	50	@100



# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33%, @ 33%, & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33%  
North's.....10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35%  
Taplin's Perfection.....35%

## Ammunition—

See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvil..... $\frac{1}{2}$  lb. 6%  
Hay-Budden..... $\frac{1}{2}$  lb. 6%  
Horsehoe brand, Wrought..... $\frac{1}{2}$  lb. 6%  
Trenton..... $\frac{1}{2}$  lb. 6%

## Imported—

Peter Wright & Sons..... $\frac{1}{2}$  lb. 10%  
Anvil, Vise and Drill—

Millers' Pair Co. \$18.00.....15&10%

## Apple Parers—

See Parers, Apple, &c.

## Aprons, Blacksmiths—

Livingston Nail Co.....33%

## Augers and Bits—

Com. Double Spur.....75@75&5%  
Jennings' Patn., reg. finish.....60&10&60%

## Black Lip or Blue—

Boring Mach. Augers.....70&10%

## Car Bits, 12-in. twist—

Ford's Auger and Car Bits.....40&5%

## Forster Pat. Auger Bits—

C. E. Jennings & Co.....35%

## No. 10 ext. tip, R. Jennings' list—

No. 30, R. Jennings' list.....40&7%  
Russell Jennings.....25&10&25%

## L'Hommiedieu Car Bits—

Mayhew's Counter Sink Bits.....15%  
Millers' Falls.....25&10%

## Ohio Tool Co.'s Bailey Auger and Car Bits—

Pugh's Black.....20%  
Pugh's Jennings' Pattern.....35%  
Snell's Auger Bits.....35%  
Snell's Bell Hangers' Bits.....35%  
Snell's Car Bits, 12-in. twist.....50&10%

## Wright's Jennings' Bits—

See Drills, Twist.

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Clark's small, \$15, large, \$25.....50&10%  
Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$25.....35%  
No. 2, \$15.....35%  
Ford's, Clark's Pattern.....60&5%  
C. E. Jennings & Co., Steer's Pat. 25%  
Swan's.....35%

## Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25  
German Pattern, Nos. 1 to 10, \$1.60; 11 to 13, \$5.75

## Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00  
Ames.....25&10%  
Universal.....20%  
Wood's Universal.....25%

## Ship Augers and Bits—

Ship Augers.....\$5.45@6.00  
Ford's.....35&5%  
C. E. Jennings & Co.....35%

## L'Hommiedieu's—

Watrous.....35&5%  
Ohio Tool Co.'s.....40%  
Snell's.....40%

## Awl Hafts—

See Hafts, Acl.

## Awls—

Brad Awls:  
Handled.....gro. \$2.75@3.00  
Unhanded, Shl'dered.....gro. \$2.50@2.75  
Unhanded, Patent.....gro. \$2.50@2.75

## Peg Awls—

Unhanded, Patent.....gro. \$1.31@1.40  
Unhanded, Shl'dered.....gro. \$1.00@1.10  
Scratch Awls:  
Handled, Com.....gro. \$3.50@4.00  
Handled, Socket.....gro. \$11.50@12.00  
Hurwood.....40%

## Awl and Tool Sets—

See Sets, Awl and Tool.

## Axes—

Single Bit, base weights:  
First Quality.....\$6.75  
Second Quality.....\$6.25  
Double Bit, base weights:  
First Quality.....\$9.00  
Second Quality.....\$8.50

## Axle Grease—

See Grease, Axle

## Axles—

Iron or Steel  
Concord, Loose Collar.....1%  
Concord, Solid Collar.....1%  
Silver Chime.....33%

## No. 1 Common, Loose—

No. 1 1/2 Com., New Styles.....4%  
No. 2 Solid Collar.....4%  
Half Patent:

Nos. 7, 8, 11 and 12.....75@75&5%  
Nos. 13 to 14.....70&10&75&5%  
Nos. 15 to 18.....75&10&75&5%  
Nos. 19 to 22.....75&10&75&5%

## Boxes, Axle—

Common and Concord, not turned.....1b. 1%  
Common and Concord, turned.....1b. 5%  
Half Patent.....1b. 8%  
Fishing—

Hendryx.....30%  
A Bait.....25%  
B Bait.....25%  
Comptitor Bait.....20&5%

## Balances—

Caldwell new list.....50%  
Pullman.....50&10&60%

## Spring—

Spring Balances.....50&10&60%  
Chatillon's:  
Light Spg. Balances.....40&10%  
Straight Balances.....40%  
Circular Balances.....50%  
Large Dial.....50%

## Barb Wire—

See Wire, Barb.

## Bars—

Steel Crowbars, 10 to 40 lb. per lb., 2.50@2.75

## Towel

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$  gro. \$8.50

## Beams, Scale—

Scale Beams.....40&10&50%  
Chatillon's No. 1.....30%  
Chatillon's No. 2.....40%

## Beaters, Carpet—

Holt-Lyon Co.:  
No. 12 Wire Coppered  $\frac{1}{2}$  doz. \$4.25; Tinned.....\$1.00  
No. 11 Wire Coppered  $\frac{1}{2}$  doz. \$1.10; Tinned.....\$1.20  
No. 10 Wire Galvanized  $\frac{1}{2}$  doz. \$1.75  
Western W. G. Co.:  
No. 1 Electric..... $\frac{1}{2}$  gro. \$7.80  
No. 2 Buffalo..... $\frac{1}{2}$  gro. \$9.00  
No. 3 Perfection Dust..... $\frac{1}{2}$  gro. \$8.00

## Egg—

Holt-Lyon Co.:  
Holt, No. A, Japanned..... $\frac{1}{2}$  doz. \$1.20  
Holt, No. 1, Tinned..... $\frac{1}{2}$  doz. \$1.50  
Holt, No. B, Japanned..... $\frac{1}{2}$  doz. \$2.00  
Holt, No. 2, Tinned..... $\frac{1}{2}$  doz. \$2.25  
Holt, No. 3, Japanned..... $\frac{1}{2}$  doz. \$1.25  
Holt, No. 4, Japanned..... $\frac{1}{2}$  doz. \$1.50  
Taplin Mfg. Co.:  
No. 60 Improved Dorer.....\$5.00  
No. 75 Improved Dorer.....\$7.00  
No. 102 Improved Dorer, Tin'd.....\$8.50  
No. 150 Improved Dorer, Hotel.....\$15.00  
No. 152 Imp'd Dorer, Hotel, T'd.....\$17.00  
No. 200 Imp'd Dorer, Tumbler.....\$35.50  
No. 202 Imp'd Dorer, Tumbler, T'd.....\$35.50  
No. 300 Imp'd Dorer, Mammoth.....\$25.00  
doz.....\$25.00  
Western W. G. Co., Buffalo.....\$7.00  
Wonder (S. B. & Co.),  $\frac{1}{2}$  gro. net, \$6.00

## Bellows—

Blacksmith, Standard List.....60&10&70&10%

## Hand—

Inch.....6 7 8 9 10  
Doz.....\$1.75 5.70 6.65 7.60 8.85

## Molders—

Inch.....9 10 11 12 14  
Doz.....\$8.00 9.00 10.50 12.50 14.50

## Bells—

Ordinary goods.....75&5@75&10&5%  
High grade.....70&10&70&10&5%  
Jersey.....75&10%  
Texas Star.....50%

## Door—

Abbe's Gong.....45%  
Burton Gong.....50%  
Home, R. & E. Mfg. Co.'s.....55&10%  
Lever and Pull, Sargent's.....60&10&10%  
Trip Gong.....50&10&50&10&5%  
Yankee Gong.....55%

## Hand Bells, Polished, Brass—

White Metal.....60&5@60&10%  
Nickel Plated.....50&10&70&10&5%  
Sulias.....60&10&70&10%  
Cone's Globe Hand Bells.....33%  
Silver Chime.....33%

## Miscellaneous—

Farm Bells.....1b. 2%  
Steel Alloy Church and School.....50&10&50&10&5%  
American Tube & Stamping Co. Gongs.....75%  
Table Call Bells.....50&10&50&10%

## Belting—

Extra Heavy, Short Lap.....60&5%  
Regular Short Lap.....60&10&5%  
Standard.....70%  
Light Standard.....70&5%  
Cut Leather Lacing.....60%  
Leather Lacing Sides, per sq. ft. 22¢

## Rubber—

Agricultural (Low Grade).....75@75&5%  
Common Standard.....70@70&10%  
Standard.....60&5@60&10%  
Extra.....60@60&5%  
High Grade.....60&5@60&10%

## Bench Stops—

See Stops, Bench

## Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%  
Green River Tire Benders and Upsetters.....20%  
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$1.25; No. 2, \$1.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

## Bicycle Goods—

John S. Lang's Son's 1902 list:  
Chain.....50%  
Parts.....50%  
Spokes.....50%  
Tubes.....60%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

## Blocks—

Common Wooden.....70&10@75%  
Harris St. Tackle Blocks.....50&5&5%  
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%  
Lane's Patent Automatic Lock and Junior.....30%  
Stowell's Novelty, Mal. Iron.....50&10%  
Stowell's Self Loading.....60%  
See also Machines, Hoisting.

## Boards, Stove—

Zinc, Crystal, &c.....30&10@40&10%

## Boards, Wash—

See Washboards.

## Bobs, Plumb—

Keuffel & Easer Co.....23%  
Bolts—

## Carriage, Machine, &c.—

Common Carriage (cut thread):  
% 4 and smaller.....75@%  
Larger and Longer.....65&5%  
Phila. Eagle \$3.00 list May 21, '99 80%

## Bolt Ends, list Feb. 14, '95—

Machine,  $\frac{1}{2}$  & 4 and smaller 75@-%  
Machine, larger and longer 65&10@-%

## Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:  
Inch.....3 4 5 6 8  
Per doz. \$0.30 .35 .45 .60 .80  
Cast Iron Spring Foot, Jap'd:  
Inch.....6 8 10  
Per doz.....\$1.20 1.50 2.25  
Cast Iron Chain, Flat, Japanned:  
Inch.....6 8 10  
Per doz.....\$1.00 1.40 1.65  
Cast Iron Flat Shutter, Jap'd, Brass Knobs:  
Inch.....6 8 10  
Per doz.....\$0.75 .35 1.25  
Wrt. Barrel Jap'd.....80@80&10%  
Wrt. "Bronzed".....50@50&10%  
Wrt. Spring.....70&10@70&10&10%  
Wrt. Shutter.....60&5@50&10&5%  
Wrt. Square Neck.....75@75&10%  
Wrt. Square Neck.....75@75&10%  
Ives' Patent Door.....80%

## Plow and Stove—

Plow.....65&10&65&10@70%  
Stove.....87%&10@%

## Tire—

Common.....80&10&5%  
Norway Iron.....80%  
American Screw Company:  
Norway Phila., list Oct. 16, '84.....82%  
Eagle Phila., list Oct. 16, '84.....82%  
Bay State, list Dec. 28, '99.....80%  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82%  
Belcher, list Dec. 28, '99.....80%  
Mount Carmel Bolt Co.:  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82%  
Mount Carmel, list Dec. 28, '99.....80%  
Russell, Burdall & Ward Bolt & Nut Co.:  
Empire, list Dec. 28, '99.....80%  
Norway Phila., list Oct. 16, '84.....80%  
Upon Nut Co.:  
Tire Bolts.....72&10%

## Borers, Tap—

Borers Tap, Ring, with Handle:  
Inch.....1 1/2 1 3/4 1 1/2 1 3/4 1 1/2  
Per doz.....\$1.80 5.60 6.40 8.00  
Inch.....2 1/2 2 3/4 2 1/2 2 3/4 2 1/2  
Per doz.....\$5.65 11.50  
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

## Boxes, Mitre—

C. E. Jennings & Co.....30%  
Langdon.....15&10%  
Perfection.....40%  
Seavey.....33&5%  
Stanley R. & L. Co.:  
Nos. 250 to 400.....30%  
Nos. 50 and 60.....35%

## Braces—

Common Ball, American.....\$1.25@1.50  
Barber's.....50&10&100&10%  
Fray's Genuine Spofford's.....10%  
Fray's No. 70 to 120, 81 to 123, 207 to 411.....60%  
C. E. Jennings & Co.....30&5%  
Mayhew's Ratchet.....30&5%  
Mayhew's Quick Action Hay Pat. 50%  
Millers' Falls Drill Braces.....25&10%  
P. S. & W. Co., Peck's Pat. 60&10%  
Stanley R. & L. Co.:  
Stanley.....35%  
Victor.....60%

## Brackets—

Wrought Steel.....80&10@80&10&5%  
Griffin's Pressed Steel.....80&10&10%  
Griffin's Folding Brackets.....70&10%  
Stowell's Cast Shelf.....75%  
Stowell's Sink.....30%  
Western W. G. Co., Wire.....C&10%

## Bright Wire Goods—

See Wire and Wire Goods.

## Broilers—

Kilbourne Mfg. Co.....75&20%  
Western W. G. Co.....80%  
Wire Goods Co.....75@75&10%

## Buckets, Galvanized—

Price per dozen:  
Quart.....19 12 14  
Water, Regular.....1.40 1.70 1.90  
Water, Heavy.....3.40 3.70 3.80  
Fire, Rd. Bottom.....2.30 2.55 2.95  
Well.....2.55 2.87 3.15

## Bucks, Saw—

Hoosier..... $\frac{1}{2}$  gro. \$36.00

## Bull Rings—

See Rings, Bull

## Butts—

Wrought, list Sept., '98.....20&5%  
Cast Brass, Tiebout's.....50%

## Cast Iron—

Fast Joint, Broad.....40&10&50%  
Fast Joint, Narrow.....40&10&50%  
Loose Joint.....70&10&75%  
Loose Pin.....70&10&75%  
Mayer's Hinges.....75@70&5%  
Parliament Butts.....70@70&5%

## Wrought Steel—

Table and Back Flaps.....75%  
Narrow and Broad.....75%  
Inside Blind.....75%  
Loose Pin.....75%  
Loose Pin, Jap'd.....70&10%  
Loose Pin, Ball and Steeple Tip.....85%  
Japanned Ball Tip Butts.....73&10%

## Bronzed, Wrt., Nar. and Inside Blind Butts—

55&10%

## Cages, Bird—

Hendryx, Brass:  
3000, 5000, 11000 series.....5%  
1200 series.....10%  
200, 300, 600 and 900 series.....10%  
Ex. 1000 list 1000 list 1000 list 1000 list

Henry's Bronze: 700, 800 series. 40&10%  
Henry's Enamelled. 40&10%

**Calipers—See Compasses.**  
**Calks, Toe and Heel—**

Blunt, 1 prong. per lb. 14¢  
Sharp, 1 prong. per lb. 14¢  
Burke's Blunt. 14¢  
Burke's Sharp. 14¢  
Gautier, Blunt. 14¢  
Gautier, Sharp. 14¢  
Perkins', Blunt Toe. 14¢  
Perkins', Sharp Toe. 14¢

**Can Openers—**  
See Openers, Can.

**Cans, Milk—**

5 8 10 gal.  
Illinois Pattern. \$1.35 1.85 2.05 each.  
New York Pattern. 1.50 2.20 2.45 each.  
Baltimore Pattern. 1.50 2.20 2.45 each.  
Baltimore. 1.35 1.60 1.75 each.

**Cans, Oil—**

Buttalo Family Oil Cans:  
\$18.00 60.00 120.00 gro. net.

**Caps, Percussion—**

Eley's E. B. 50¢  
G. D. 50¢  
F. L. 50¢  
G. E. 50¢  
Musket 50¢

**Primers—**

Berdan Primers, \$2 per M. 80%  
B. L. Caps (Sturtevant Shell). 80%  
\$2 per M. 80%  
All other primers per M. \$1.50 @ 1.60

**Cartridges—**

Blank Cartridges:  
32 C. F., \$5.50. 10¢  
32 C. F., \$7.00. 10¢  
28 cal. Rm., \$1.50. 10¢  
28 cal. Rm., \$2.75. 10¢  
B. B. Caps, Con. Ball, Supd. \$1.90  
B. B. Caps, Round Ball. \$1.49  
Central Fire. 25¢  
Target and Sporting Rifle. 15¢  
Primed Shells and Bullets. 15¢  
Rim Fire, Sporting. 50¢  
Rim Fire, Military. 15¢

**Casters—**

Bed. 70¢  
Plate. 60¢  
Philadelphia. 75¢  
Acme, Ball Bearing. 33¢  
Boss. 70¢  
Ross Anti-Friction. 70¢  
Gem (Roller Bearing). 45¢  
Martin's Patent (Phoenix). 45¢  
Standard Ball Bearing. 45¢  
Tucker's Patent low list. 30¢  
Yale (Double Wheel) low list. 50¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Coil—**

American Coil, Straight Link:  
3-16 5-16 7-16 1 1/2 2 1/2 3-1/2 4-1/2 5-1/2 6-1/2 7-1/2 8-1/2 9-1/2 10-1/2 11-1/2 12-1/2 13-1/2 14-1/2 15-1/2 16-1/2 17-1/2 18-1/2 19-1/2 20-1/2 21-1/2 22-1/2 23-1/2 24-1/2 25-1/2 26-1/2 27-1/2 28-1/2 29-1/2 30-1/2 31-1/2 32-1/2 33-1/2 34-1/2 35-1/2 36-1/2 37-1/2 38-1/2 39-1/2 40-1/2 41-1/2 42-1/2 43-1/2 44-1/2 45-1/2 46-1/2 47-1/2 48-1/2 49-1/2 50-1/2 51-1/2 52-1/2 53-1/2 54-1/2 55-1/2 56-1/2 57-1/2 58-1/2 59-1/2 60-1/2 61-1/2 62-1/2 63-1/2 64-1/2 65-1/2 66-1/2 67-1/2 68-1/2 69-1/2 70-1/2 71-1/2 72-1/2 73-1/2 74-1/2 75-1/2 76-1/2 77-1/2 78-1/2 79-1/2 80-1/2 81-1/2 82-1/2 83-1/2 84-1/2 85-1/2 86-1/2 87-1/2 88-1/2 89-1/2 90-1/2 91-1/2 92-1/2 93-1/2 94-1/2 95-1/2 96-1/2 97-1/2 98-1/2 99-1/2 100-1/2 101-1/2 102-1/2 103-1/2 104-1/2 105-1/2 106-1/2 107-1/2 108-1/2 109-1/2 110-1/2 111-1/2 112-1/2 113-1/2 114-1/2 115-1/2 116-1/2 117-1/2 118-1/2 119-1/2 120-1/2 121-1/2 122-1/2 123-1/2 124-1/2 125-1/2 126-1/2 127-1/2 128-1/2 129-1/2 130-1/2 131-1/2 132-1/2 133-1/2 134-1/2 135-1/2 136-1/2 137-1/2 138-1/2 139-1/2 140-1/2 141-1/2 142-1/2 143-1/2 144-1/2 145-1/2 146-1/2 147-1/2 148-1/2 149-1/2 150-1/2 151-1/2 152-1/2 153-1/2 154-1/2 155-1/2 156-1/2 157-1/2 158-1/2 159-1/2 160-1/2 161-1/2 162-1/2 163-1/2 164-1/2 165-1/2 166-1/2 167-1/2 168-1/2 169-1/2 170-1/2 171-1/2 172-1/2 173-1/2 174-1/2 175-1/2 176-1/2 177-1/2 178-1/2 179-1/2 180-1/2 181-1/2 182-1/2 183-1/2 184-1/2 185-1/2 186-1/2 187-1/2 188-1/2 189-1/2 190-1/2 191-1/2 192-1/2 193-1/2 194-1/2 195-1/2 196-1/2 197-1/2 198-1/2 199-1/2 200-1/2 201-1/2 202-1/2 203-1/2 204-1/2 205-1/2 206-1/2 207-1/2 208-1/2 209-1/2 210-1/2 211-1/2 212-1/2 213-1/2 214-1/2 215-1/2 216-1/2 217-1/2 218-1/2 219-1/2 220-1/2 221-1/2 222-1/2 223-1/2 224-1/2 225-1/2 226-1/2 227-1/2 228-1/2 229-1/2 230-1/2 231-1/2 232-1/2 233-1/2 234-1/2 235-1/2 236-1/2 237-1/2 238-1/2 239-1/2 240-1/2 241-1/2 242-1/2 243-1/2 244-1/2 245-1/2 246-1/2 247-1/2 248-1/2 249-1/2 250-1/2 251-1/2 252-1/2 253-1/2 254-1/2 255-1/2 256-1/2 257-1/2 258-1/2 259-1/2 260-1/2 261-1/2 262-1/2 263-1/2 264-1/2 265-1/2 266-1/2 267-1/2 268-1/2 269-1/2 270-1/2 271-1/2 272-1/2 273-1/2 274-1/2 275-1/2 276-1/2 277-1/2 278-1/2 279-1/2 280-1/2 281-1/2 282-1/2 283-1/2 284-1/2 285-1/2 286-1/2 287-1/2 288-1/2 289-1/2 290-1/2 291-1/2 292-1/2 293-1/2 294-1/2 295-1/2 296-1/2 297-1/2 298-1/2 299-1/2 300-1/2 301-1/2 302-1/2 303-1/2 304-1/2 305-1/2 306-1/2 307-1/2 308-1/2 309-1/2 310-1/2 311-1/2 312-1/2 313-1/2 314-1/2 315-1/2 316-1/2 317-1/2 318-1/2 319-1/2 320-1/2 321-1/2 322-1/2 323-1/2 324-1/2 325-1/2 326-1/2 327-1/2 328-1/2 329-1/2 330-1/2 331-1/2 332-1/2 333-1/2 334-1/2 335-1/2 336-1/2 337-1/2 338-1/2 339-1/2 340-1/2 341-1/2 342-1/2 343-1/2 344-1/2 345-1/2 346-1/2 347-1/2 348-1/2 349-1/2 350-1/2 351-1/2 352-1/2 353-1/2 354-1/2 355-1/2 356-1/2 357-1/2 358-1/2 359-1/2 360-1/2 361-1/2 362-1/2 363-1/2 364-1/2 365-1/2 366-1/2 367-1/2 368-1/2 369-1/2 370-1/2 371-1/2 372-1/2 373-1/2 374-1/2 375-1/2 376-1/2 377-1/2 378-1/2 379-1/2 380-1/2 381-1/2 382-1/2 383-1/2 384-1/2 385-1/2 386-1/2 387-1/2 388-1/2 389-1/2 390-1/2 391-1/2 392-1/2 393-1/2 394-1/2 395-1/2 396-1/2 397-1/2 398-1/2 399-1/2 400-1/2 401-1/2 402-1/2 403-1/2 404-1/2 405-1/2 406-1/2 407-1/2 408-1/2 409-1/2 410-1/2 411-1/2 412-1/2 413-1/2 414-1/2 415-1/2 416-1/2 417-1/2 418-1/2 419-1/2 420-1/2 421-1/2 422-1/2 423-1/2 424-1/2 425-1/2 426-1/2 427-1/2 428-1/2 429-1/2 430-1/2 431-1/2 432-1/2 433-1/2 434-1/2 435-1/2 436-1/2 437-1/2 438-1/2 439-1/2 440-1/2 441-1/2 442-1/2 443-1/2 444-1/2 445-1/2 446-1/2 447-1/2 448-1/2 449-1/2 450-1/2 451-1/2 452-1/2 453-1/2 454-1/2 455-1/2 456-1/2 457-1/2 458-1/2 459-1/2 460-1/2 461-1/2 462-1/2 463-1/2 464-1/2 465-1/2 466-1/2 467-1/2 468-1/2 469-1/2 470-1/2 471-1/2 472-1/2 473-1/2 474-1/2 475-1/2 476-1/2 477-1/2 478-1/2 479-1/2 480-1/2 481-1/2 482-1/2 483-1/2 484-1/2 485-1/2 486-1/2 487-1/2 488-1/2 489-1/2 490-1/2 491-1/2 492-1/2 493-1/2 494-1/2 495-1/2 496-1/2 497-1/2 498-1/2 499-1/2 500-1/2 501-1/2 502-1/2 503-1/2 504-1/2 505-1/2 506-1/2 507-1/2 508-1/2 509-1/2 510-1/2 511-1/2 512-1/2 513-1/2 514-1/2 515-1/2 516-1/2 517-1/2 518-1/2 519-1/2 520-1/2 521-1/2 522-1/2 523-1/2 524-1/2 525-1/2 526-1/2 527-1/2 528-1/2 529-1/2 530-1/2 531-1/2 532-1/2 533-1/2 534-1/2 535-1/2 536-1/2 537-1/2 538-1/2 539-1/2 540-1/2 541-1/2 542-1/2 543-1/2 544-1/2 545-1/2 546-1/2 547-1/2 548-1/2 549-1/2 550-1/2 551-1/2 552-1/2 553-1/2 554-1/2 555-1/2 556-1/2 557-1/2 558-1/2 559-1/2 560-1/2 561-1/2 562-1/2 563-1/2 564-1/2 565-1/2 566-1/2 567-1/2 568-1/2 569-1/2 570-1/2 571-1/2 572-1/2 573-1/2 574-1/2 575-1/2 576-1/2 577-1/2 578-1/2 579-1/2 580-1/2 581-1/2 582-1/2 583-1/2 584-1/2 585-1/2 586-1/2 587-1/2 588-1/2 589-1/2 590-1/2 591-1/2 592-1/2 593-1/2 594-1/2 595-1/2 596-1/2 597-1/2 598-1/2 599-1/2 600-1/2 601-1/2 602-1/2 603-1/2 604-1/2 605-1/2 606-1/2 607-1/2 608-1/2 609-1/2 610-1/2 611-1/2 612-1/2 613-1/2 614-1/2 615-1/2 616-1/2 617-1/2 618-1/2 619-1/2 620-1/2 621-1/2 622-1/2 623-1/2 624-1/2 625-1/2 626-1/2 627-1/2 628-1/2 629-1/2 630-1/2 631-1/2 632-1/2 633-1/2 634-1/2 635-1/2 636-1/2 637-1/2 638-1/2 639-1/2 640-1/2 641-1/2 642-1/2 643-1/2 644-1/2 645-1/2 646-1/2 647-1/2 648-1/2 649-1/2 650-1/2 651-1/2 652-1/2 653-1/2 654-1/2 655-1/2 656-1/2 657-1/2 658-1/2 659-1/2 660-1/2 661-1/2 662-1/2 663-1/2 664-1/2 665-1/2 666-1/2 667-1/2 668-1/2 669-1/2 670-1/2 671-1/2 672-1/2 673-1/2 674-1/2 675-1/2 676-1/2 677-1/2 678-1/2 679-1/2 680-1/2 681-1/2 682-1/2 683-1/2 684-1/2 685-1/2 686-1/2 687-1/2 688-1/2 689-1/2 690-1/2 691-1/2 692-1/2 693-1/2 694-1/2 695-1/2 696-1/2 697-1/2 698-1/2 699-1/2 700-1/2 701-1/2 702-1/2 703-1/2 704-1/2 705-1/2 706-1/2 707-1/2 708-1/2 709-1/2 710-1/2 711-1/2 712-1/2 713-1/2 714-1/2 715-1/2 716-1/2 717-1/2 718-1/2 719-1/2 720-1/2 721-1/2 722-1/2 723-1/2 724-1/2 725-1/2 726-1/2 727-1/2 728-1/2 729-1/2 730-1/2 731-1/2 732-1/2 733-1/2 734-1/2 735-1/2 736-1/2 737-1/2 738-1/2 739-1/2 740-1/2 741-1/2 742-1/2 743-1/2 744-1/2 745-1/2 746-1/2 747-1/2 748-1/2 749-1/2 750-1/2 751-1/2 752-1/2 753-1/2 754-1/2 755-1/2 756-1/2 757-1/2 758-1/2 759-1/2 760-1/2 761-1/2 762-1/2 763-1/2 764-1/2 765-1/2 766-1/2 767-1/2 768-1/2 769-1/2 770-1/2 771-1/2 772-1/2 773-1/2 774-1/2 775-1/2 776-1/2 777-1/2 778-1/2 779-1/2 780-1/2 781-1/2 782-1/2 783-1/2 784-1/2 785-1/2 786-1/2 787-1/2 788-1/2 789-1/2 790-1/2 791-1/2 792-1/2 793-1/2 794-1/2 795-1/2 796-1/2 797-1/2 798-1/2 799-1/2 800-1/2 801-1/2 802-1/2 803-1/2 804-1/2 805-1/2 806-1/2 807-1/2 808-1/2 809-1/2 810-1/2 811-1/2 812-1/2 813-1/2 814-1/2 815-1/2 816-1/2 817-1/2 818-1/2 819-1/2 820-1/2 821-1/2 822-1/2 823-1/2 824-1/2 825-1/2 826-1/2 827-1/2 828-1/2 829-1/2 830-1/2 831-1/2 832-1/2 833-1/2 834-1/2 835-1/2 836-1/2 837-1/2 838-1/2 839-1/2 840-1/2 841-1/2 842-1/2 843-1/2 844-1/2 845-1/2 846-1/2 847-1/2 848-1/2 849-1/2 850-1/2 851-1/2 852-1/2 853-1/2 854-1/2 855-1/2 856-1/2 857-1/2 858-1/2 859-1/2 860-1/2 861-1/2 862-1/2 863-1/2 864-1/2 865-1/2 866-1/2 867-1/2 868-1/2 869-1/2 870-1/2 871-1/2 872-1/2 873-1/2 874-1/2 875-1/2 876-1/2 877-1/2 878-1/2 879-1/2 880-1/2 881-1/2 882-1/2 883-1/2 884-1/2 885-1/2 886-1/2 887-1/2 888-1/2 889-1/2 890-1/2 891-1/2 892-1/2 893-1/2 894-1/2 895-1/2 896-1/2 897-1/2 898-1/2 899-1/2 900-1/2 901-1/2 902-1/2 903-1/2 904-1/2 905-1/2 906-1/2 907-1/2 908-1/2 909-1/2 910-1/2 911-1/2 912-1/2 913-1/2 914-1/2 915-1/2 916-1/2 917-1/2 918-1/2 919-1/2 920-1/2 921-1/2 922-1/2 923-1/2 924-1/2 925-1/2 926-1/2 927-1/2 928-1/2 929-1/2 930-1/2 931-1/2 932-1/2 933-1/2 934-1/2 935-1/2 936-1/2 937-1/2 938-1/2 939-1/2 940-1/2 941-1/2 942-1/2 943-1/2 944-1/2 945-1/2 946-1/2 947-1/2 948-1/2 949-1/2 950-1/2 951-1/2 952-1/2 953-1/2 954-1/2 955-1/2 956-1/2 957-1/2 958-1/2 959-1/2 960-1/2 961-1/2 962-1/2 963-1/2 964-1/2 965-1/2 966-1/2 967-1/2 968-1/2 969-1/2 970-1/2 971-1/2 972-1/2 973-1/2 974-1/2 975-1/2 976-1/2 977-1/2 978-1/2 979-1/2 980-1/2 981-1/2 982-1/2 983-1/2 984-1/2 985-1/2 986-1/2 987-1/2 988-1/2 989-1/2 990-1/2 991-1/2 992-1/2 993-1/2 994-1/2 995-1/2 996-1/2 997-1/2 998-1/2 999-1/2 1000-1/2

**Halter Chains—** 60¢  
**German Pattern Halter Chains—** 60¢  
**list July 24, '97—** 60¢  
**Covert Mfg. Co.—** 35¢  
**Halter—** 35¢  
**Covert's Saddlery Works—** 70¢  
**Halter—** 70¢

**Cow Ties—**

See Halters and Ties.

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.  
6-1/2-8, Strght, with ring. \$23.50  
6-1/2-8, Strght, with ring. \$24.50  
6-1/2-8, Strght, with ring. \$28.00  
6-1/2-10, Strght, with ring. \$32.00  
NOTE—Add 2¢ per pair for Hooks.  
Twist Traces 2¢ per pair higher than  
Straight Link.

**Trace, Wagon and Fancy**  
**Chains—** 60¢  
**Miscellaneous—**

Jack Chain, list July 10, '93:  
Iron. 60¢  
Brass. 60¢  
Safety Chain. 70¢  
Gal. Pump Chain. 10¢  
Covert Mfg. Co.:  
Breast. 35¢  
Heel. 35¢  
Rein. 35¢  
Stallion. 35¢  
Covert Sad. Works:  
Breast. 70¢  
Hold Back. 70¢  
Rein. 70¢  
Owida Community:  
Am. Dog Leads and Kennel Chains. 40¢  
Niagara Dog Leads and Kennel  
Chains. 45¢  
Wire Goods Co.:  
Dog Chain. 70¢  
Universal Dbl.-Jointed Chain. 50¢  
**Chain and Ribbon, Sash—**  
Owida Community:  
Copper Chain. 60¢  
Steel Chain. 80¢  
Pullman:  
Bronze Chain. 60¢  
Steel Chain. 60¢  
Sash Chain Attachments, per set. 8¢  
Aluminum Sash Ribbon, per 100  
ft. \$1.25 @ \$3.00  
Sash Ribbon Attachments, per set. 8¢  
**Chalk—** (From Jobbers.)  
Carpenters' Blue. 30¢  
Carpenters' Red. 30¢  
Carpenters' White. 30¢  
See also Crayons.

**Checks, Door—**

Bardley's. 45¢  
Eclipse. 60¢  
Pullman, per gro. \$34.00  
Russwin. 40¢

**Chests, Tool—**

American Tool Chest Co.:  
Boys' Chests, with Tools. 55¢  
Youths' Chests, with Tools. 40¢  
Gentlemen's Chests, with Tools. 30¢  
Farmers' Carpenters', etc., Chests,  
with Tools. 20¢  
Machinists' and Pipe Fitters'  
Chests, Empty. 20¢  
Tool Cabinet. 30¢  
C. E. Jennings & Co.'s Machinists'  
Tool Chests. 33¢  
**Chisels—**  
**Socket Framing and Firmer**  
**Standard List—** 75¢  
Buck Bros. 30¢  
Charles Buell Co. 30¢  
C. E. Jennings & Co. Socket Firmer  
No. 10. 60¢  
C. E. Jennings & Co. Socket Fram-  
ing No. 15. 60¢  
Ohio Tool Co.'s. 70¢  
Swan's. 75¢  
L. & I. J. White. 30¢

**Tanged—**

Tanged Firmers. 33¢  
Buck Bros. 30¢  
Charles Buell Co. 30¢  
C. E. Jennings & Co. Nos. 191, 181, 25¢  
L. & I. J. White, Tanged. 25¢  
**Cold—**  
Cold Chisels, good quality. 15¢  
Cold Chisels, fair quality. 11¢  
Cold Chisels, ordinary. 9¢  
**Chucks—**  
Beach Pat. each \$8.00. 35¢  
Emore. 30¢  
Blacksmiths. 30¢  
Jacobs' Drill Chucks. 35¢  
Pratt's Positive Drive. 25¢  
Skinner Patent Chucks:  
Independent Lathe Chucks. 50¢  
Universal. 50¢  
Combination. 50¢  
Drill Chucks, New Model. 30¢  
Drill Chucks, Standard. 45¢  
Drill Chuck, Skinner Pat. all sizes. 35¢  
Drill Chucks, Positive Drive. 30¢  
Planer Chucks. 25¢  
Face Plate Jaws. 40¢  
Standard Lathe Chucks:  
Improved Drill Chuck. 45¢  
Union Mfg. Co.:  
Combination. 50¢  
Czar Drill. 35¢  
Combination Geared Scroll. 40¢  
Geared Scroll. 40¢  
Independent. 50¢  
Independent Steel. 40¢  
Union Drill. 45¢  
Universal. 50¢  
Independent Iron F. Plate Jaws. 40¢  
Independent Steel F. Plate Jaws. 40¢  
Westcott Lathe Chucks:  
Little Giant Auxiliary Drill. 50¢  
Little Giant Double Grip Drill. 50¢  
Little Giant Drill, Improved. 50¢  
Oneida Drill. 50¢  
Scroll Combination Lathe. 50¢

**Clamps—**

Adjustable, Hammers. 20¢  
Cabinet, Sargent's. 50¢  
Carriage Makers', F. S. & W.  
Co. 40¢  
Carriage Makers', Sargent's. 60¢  
Besly, Parallel. 33¢  
Lineman's, Utica Drop Forge & Tool  
Co. 40¢  
Saw Clamps, see Vises, Saw Filers.  
Wood Workers, Hammers. 40¢  
**Cleaners, Drain—**  
Iwan's Champion, Adjustable. 55¢  
Iwan's Champion, Stationary. 45¢  
**Sidewalk—**  
Star Socket, All Steel. 30¢  
Star Shank, All Steel. 30¢  
W. & C. Shank, All Steel. 30¢  
7 1/2 in. \$3.00; 8 in. \$3.25.

**Cleavers, Butchers—**

Foster Bros. 30¢  
New Haven Edge Tool Co.'s. 45¢  
Fayette R. Plumb. 33¢  
L. & I. J. White. 30¢

**Clippers—**

Chicago Flexible Shaft Company:  
'98 Chicago Horse. 15¢  
1902 Chicago Horse. 10¢  
20th Century Horse, each. 20¢  
Lighting Belt. 15¢  
Chicago Belt. 15¢  
Stewart's Patent Sheep. 12¢

**Clips, Axle—**

Eagle, 5-16 and 3/4 in. 75¢  
Norway,



**Fasteners, Blind—**

Zimmerman's ..... 50¢10¢  
Walling's ..... 40¢10¢

**Cord and Weight—**

Ives ..... 40¢

**Faucets—**

Cork Lined ..... 50¢50¢10¢  
Metallic Key, Leather Lined ..... 60¢10¢70¢

Red Cedar ..... 40¢10¢50¢  
Petroleum ..... 70¢10¢75¢

B. & L. B. Co. .... 60¢10¢  
Star ..... 60¢

West Lock ..... 50¢10¢  
John Sommer's Peerless Tin Key ..... 40¢

John Sommer's Boss Tin Key ..... 50¢  
John Sommer's Victor Mtl. Key ..... 50¢

John Sommer's Duplex Metal Key ..... 60¢  
John Sommer's Diamond Lock ..... 40¢

John Sommer's I. X. L. Cork Lined ..... 50¢  
John Sommer's Reliable Cork Lined ..... 50¢10¢

John Sommer's Chicago Cork Lined ..... 60¢  
John Sommer's O. K. Cork Lined ..... 50¢

John Sommer's No Brand Cedar ..... 50¢  
John Sommer's Perfection Cedar ..... 40¢

McKenna, Brass ..... 40¢  
Burglar Proof, N. P. .... 25¢

Improved, ¾ and ½ inch ..... 25¢  
Self Measuring ..... 40¢10¢

Enterprise, ¾ doz. \$36.00 ..... 40¢10¢  
Lane's, ¾ doz. \$36.00 ..... 40¢10¢

National Measuring, ¾ doz. \$36.00 ..... 40¢10¢

**Felloe Plates—**

See Plates, Felloe.

**Files— Domestic—**

List revised Nov. 1, 1899.

Best Brands ..... 70¢10¢75¢45¢  
Standard Brands ..... 75¢10¢75¢10¢10¢

Lower Grade ..... 75¢10¢10¢80¢10¢

**Imported—**

Stubs' Tapers, Stubs' List, July 24, '97 ..... 83 1-3 @ 40¢

**Fixtures, Fire Door—**

Richards Mfg. Co. .... \$3.75  
Universal No. 103 ..... \$3.75

Special No. 104 ..... \$3.75  
Fusible Links, No. 96 ..... 50¢

Expansion Bolts, No. 107 ..... 60¢10¢

**Grindstone—**

Net Prices:

Inch ..... 15 17 19 21  
Per doz. .... \$3.25 3.75 4.25 4.75

P. S. & W. Co. .... 50¢10¢40¢  
Reading Hardware Co. .... 60¢

Sargent's ..... 70¢  
Stowell's Giant Grindstone Hanger ..... 70¢

Stowell's Grindstone Fixtures, Extra Heavy ..... 50¢10¢10¢

Stowell's Grindstone Fixtures, Light ..... 60¢10¢

**Fodder Squeezers—**

See Compressors.

**Forks—**

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Key Potato ..... 60¢10¢  
Victor, Hay ..... 60¢10¢25¢

Victor, Manure ..... 60¢  
Victor, Header ..... 60¢

Champion, Hay ..... 60¢  
Champion, Header ..... 60¢

Champion, Manure ..... 60¢10¢25¢  
Columbia, Hay ..... 60¢

Columbia, Manure ..... 60¢  
Columbia, Spading ..... 70¢12¢

Hawkeye Wood Barley ..... 40¢  
W. & C. Potato Digger ..... 60¢10¢

Acme Hay ..... 60¢  
Acme Manure, 4 tins ..... 60¢10¢

Dakota Header ..... 60¢20¢  
Jackson Steel Barley ..... 60¢20¢

Kansas Header ..... 60¢  
W. & C. Favorite Wood Barley ..... 40¢

Plated.—See Spoons.

**Frames— Saw—**

White, 8'g't Bar, per doz. 75¢80¢  
Red, 8'g't Bar, per doz. 1.10¢1.15

Red, Dbl. Brace, per doz. 1.10¢1.15

**Freezers, Ice Cream—**

Qt. .... 1 2 3 4 6  
Each ..... \$1.30 \$1.60 \$1.90 \$2.20 \$2.50

**Fruit and Jelly Presses—**

See Presses, Fruit and Jelly.

**Fry Pans—See Pans, Fry.****Fuse—**

Per 1000 Feet.

Hemp ..... \$2.75  
Cotton ..... 3.20

Waterproof Sgl. Taped. .... 3.65  
Waterproof Dbl. Taped. .... 4.40

Waterproof Tpl. Taped. .... 5.15

**Gates, Molasses and Oil—**

Stebbins' Pattern ..... 80¢10¢80¢10¢45¢

**Gauges—**

Marking, Mortise, &c. .... 50¢10¢60¢

Chapin-Stephens Co. .... 50¢10¢60¢10¢10¢

Scholl's Patent ..... 50¢10¢60¢10¢10¢

Door Hangers ..... 50¢60¢10¢

Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 30¢

Marking and Mortise ..... 30¢  
Wire, Brown & Sharpe's ..... 30¢

Wire, Morse's ..... 30¢  
Wire, P. S. & W. Co. .... 30¢

**Gimlets— Single Cut—**

Numbered assortments, per gro.

Nail, Metal, No. 1, \$2.00; 2, \$2.30  
Spike, Metal, No. 1, \$1.00; 2, \$1.30

Nail, Wood Handled, No. 1, \$2.50; 2, \$2.80

Spike, Wood Handled, No. 1, \$1.50; 2, \$1.80

**Glass, American Window—**

See Trade Report.

**Glasses, Level—**

Chapin-Stephens Co. .... 50¢60¢10¢10¢

**Glue, Liquid Fish—**

Bottles or Cans, with Brush. .... 25¢10¢50¢

International Glue Co. (Martin's) ..... 40¢

**Grease, Axle—**

Common Grade ..... gro. \$1.50@2.00

Dixon's Everlasting, 10-lb pails, ea. 35¢  
Dixon's Everlasting, in boxes, ¾ doz. 1 lb. \$1.20; 2 lb. \$2.00

Helmet Hard Oil ..... 25¢

**Grips, Nipple—**

Perfect Nipple Grips ..... 40¢10¢2¢

**Griddles, Soapstone—**

Pike Mfg. Co. .... 33¢@33¢10¢

**Grindstones—**

Bicycle Emery Grinder ..... \$4.50

Bicycle Grindstones, each ..... \$2.50@3.00

Pike Mfg. Co. .... 33¢@33¢10¢

Improved Family Grindstones, per inch, ¾ doz. .... \$2.00

Pike Mower and Tool Grinder, each ..... 33¢@33¢10¢

Velox Ball Bearing, Mounted, Angle Iron Frames, each ..... \$3.00

**Halters and Ties—**

Cow Ties ..... 60¢@60¢10¢

Covert Mfg. Co. .... 35¢45¢

Jute Rope ..... 50¢

Sisal Rope ..... 30¢10¢

Cotton Rope ..... 45¢

Hemp Rope ..... 45¢

Covert's Saddlery Works:

Web and Leather Halters ..... 70¢

Jute and Manila Rope Halters ..... 45¢50¢

Sisal Rope Halters ..... 45¢60¢45¢

Niagara Cow Ties ..... 45¢45¢50¢10¢45¢

E. T. Rugg & Co.:

Leather Halters ..... 50¢

Web Halters and Webbing ..... 60¢

Jute and Sisal Rope Halters ..... 60¢

Jute and Sisal Horse and Cattle Ties ..... 60¢

Cotton Horse Ties ..... 60¢

Livery Ties, Braided ..... 60¢

**Hammers—****Handled Hammers—**

Heller's Machinists' ..... 40¢10¢40¢10¢10¢

Heller's Farriers ..... 40¢10¢40¢10¢10¢

Magnetic Tack, Nos. 1, 2, 3, 1.25¢  
1.50¢, 1.75¢

Peck, Stow & Wilcox, Steel ..... 50¢

Fayette R. Plumb:

Plumb, A. E. Nail ..... 33¢45¢(33¢)10¢45¢

Engineers' and R. S. Hand ..... 33¢45¢

Machinists' Hammers ..... 50¢60¢10¢45¢

Riveting and Tinner's ..... 40¢25¢@40¢10¢25¢

Sargent's C. S. New List ..... 40¢

**Heavy Hammers and Sledges—**

Under 3 lb., per lb., 50¢80¢10¢10¢—

3 to 5 lb., per lb., 40¢80¢10¢10¢—

Over 5 lb., per lb., 30¢80¢10¢10¢80¢10¢10¢

Wilkinson's Smiths' ..... lb. 9¢@10¢

**Handles—**

Agricultural Tool Handles

Axe, Pick, &c. .... 60¢10¢60¢10¢45¢

Hoe, Rake, &c. .... 45¢50¢

Fork, Shovel, Spade, &c.:

Long Handles ..... 45¢50¢

D Handles ..... 50¢50¢45¢

Cross-Cut Saw Handles

Atkins ..... 40¢

Champion ..... 45¢45¢10¢

Dixson's ..... 50¢

Mechanics' Tool Handles

Auger, assorted ..... gro. \$2.50@3.00

Brad Axl. .... gro. \$1.65@1.75

Chisel Handles:

Apple Tanged Firmer, gro. assorted ..... \$2.10@2.45

Hickory Tanged Firmer, gro. assorted ..... \$2.15@2.40

Apple Socket Firmer, gro. assorted ..... \$1.75@1.95

Hickory Socket Firmer, gro. assorted ..... \$1.45@1.60

Hickory Socket Framing, gro. assorted ..... \$1.60@1.75

File, assorted ..... gro. \$1.50@1.70

Hammer, Hatchet, &c. .... 60¢10¢60¢10¢45¢

Hand Saw, Varished, doz. 80¢85¢; Not Varished ..... 65¢75¢

Jack, doz. 30¢; Jack, Bolted, 75¢  
Fore, doz. 45¢; Fore, Bolted, 90¢

Chapin-Stephens Co. .... 40¢40¢10¢

Chisel ..... 35¢65¢10¢

File and Awl ..... 55¢65¢10¢

Saw and Plane ..... 40¢40¢10¢

Screw Driver ..... 40¢40¢10¢

Millers Falls Adj. and Ratchet Auger Handles ..... 15¢10¢

Nicholson Simplicity File Handle ..... 40¢

**Hangers—**

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:

Reliable, No. 1 ..... per doz. \$9.00

Reliable, No. 2 ..... per doz. \$9.00

**Chicago Spring Butt Co.:**

Friction ..... 25¢

Oscillating ..... 25¢

Big Twin ..... 25¢

Chisholm & Moore Mfg. Co.:

Baggage Car Door ..... 50¢

Elevator ..... 50¢

Railroad ..... 50¢

Cronk & Carrier Mfg. Co.:

Loose Axle ..... 60¢10¢

Roller Bearing ..... 70¢

Griffin Mfg. Co.:

Solid Axle, No. 10, \$12.00 ..... 70¢

Roller Bearing, No. 11, \$15.00 ..... 70¢

Roller Bearing, Ex. Hy., No. 22, \$18.00 ..... 70¢

Hinged Hangers, \$16.00 ..... 60¢10¢

Lane Bros. Co.:

Parlor, Ball Bearing ..... \$4.00

Parlor, Standard ..... \$3.15

Parlor, No. 105 ..... \$2.85

Parlor, New Model ..... \$2.80

Parlor, New Champion ..... \$2.25

Barn Door, Standard ..... 60¢45¢

Hinged ..... net \$6.40

Covered ..... 60¢40¢

Special ..... 70¢45¢

Lawrence Bros.:

Advance ..... 60¢10¢

Cleveland ..... 75¢

Clipper, No. 75 ..... 60¢

Crown ..... 60¢10¢

Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25 ..... 60¢45¢

Giant ..... 60¢45¢

Hummer ..... 70¢45¢

New York ..... 60¢10¢

Peelers ..... 60¢10¢

Sterling ..... 60¢10¢

McKinney Mfg. Co.:

No. 1, Special, \$15 ..... 60¢10¢

No. 2, Standard, \$18 ..... 60¢10¢

Hinged Hangers, \$16 ..... 50¢

McKay Stangen Hangers ..... 60¢45¢

Richards Mfg. Co.:

Pioneer Wood Track No. 3, \$2.00

Ball B'r'g St'l Track No. 10, 50¢10¢

Roller B'r'g St'l Track No. 12, \$2.15

Roller B'r'g St'l Track No. 13, \$2.30

Hero, Adj. Track No. 19, 50¢10¢

Adjustable Track Tandem Trol-

ley Track No. 16 ..... 50¢10¢

Seal, Steel Track No. 8 ..... \$2.25

Auto Adj. Track No. 22, 50¢10¢

Trolley B. D. No. 17 ..... \$1.25

Trolley F. D. No. 120 ..... \$2.10

Trolley F. D. No. 121 ..... \$2.25

Trolley F. D. No. 150 ..... \$2.35

Safety Underwriters F. D. No. 101 ..... 70¢

Tandem No. 41, 2½ and 3 60¢10¢

Palace, Adjustable Track No. 132 ..... 50¢10¢

Royal, Adjustable Track No. 123

**Wrought Iron Hinges—**  
 Strap and T Hinges, etc., list  
 December 20, 1904:

**Light Strap Hinges—** 70%  
 Heavy Strap Hinges— 75%  
 Light T Hinges— 65%  
 Heavy T Hinges— 60%  
 Extra Heavy T Hinges— 70%  
 Hinge Hasps— 50%  
 Cor. Heavy Strap— 75%  
 Cor. Ex. Heavy T— 70%  
 Screw Hook— 6 to 12 in. 1b. 3 1/4¢  
 and Strap— 1 1/2 to 20 in. 1b. 3 1/4¢  
 Screw Hook and Eye— 22 to 36 in. 1b. 3¢

**Hitchers, Stall—**  
 Covert Mfg. Co., Stall Hitchers— 35%  
**Hods— Coal—**

**Per doz.**  
 Inch— 15 16 17 18  
 Galv. Open— \$2.50 2.75 3.00 3.25  
 Jap. Open— \$1.90 2.10 2.25 2.55  
 Galv. Funnel— \$3.00 3.30 3.60 3.90  
 Jap. Funnel— \$2.45 2.65 2.85 3.30

**Masons' Etc.—**  
 Avery-Caldwell Mfg. Co.:  
 Steel Brick— each \$1.00  
 Steel Mortar— each \$1.25  
 Cleveland Wire Spring Co.:  
 Steel Brick, No. 100— each \$0.95  
 Steel Mortar, No. 100— each \$1.25

**Hoes— Eye—**  
 Scott and Oval Pattern— 60¢ to 1.00  
 Grub, list Feb. 23, 1899— 70¢ to 1.00  
 D. & H. Scovill— 33 1/2%

**Handled—**  
 NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1904, or selling at net prices.

Cronk's Weeding No. 1, \$2.00; No. 2, \$2.25  
 Ft. Madison Cotton Hoe— 70¢ to 1.00  
 Ft. Madison Crescent Cultivator Hoe— 70¢ to 1.00  
 Ft. Madison Mattock Hoe— 70¢ to 1.00  
 Regular Weight— doz. 60¢  
 Junior Size— doz. \$4.00  
 Ft. Madison Sprouting Hoe— doz. 50¢  
 Ft. Madison Dixie Tobacco Hoe— 75¢ to 1.00

Kretzinger's Cut Easy— 70¢ to 1.00  
 Warren Hoe— 45¢ to 1.00  
 W. & C. Ivanhoe— 75¢ to 1.00  
 B. B. 6 in., Cultivator Hoe— \$3.15  
 B. B. 6 1/2 in.— \$3.30  
 Acme Weeding— doz. net, \$4.35  
 W. & C. L'ning Shuffie Hoe— doz. \$4.85

**Hoisting Apparatus—**  
 See Machines, Hoisting.  
**Holders— Bit—**  
 Angular, doz. \$24.00— 45¢ to 1.00

**Door—**  
 Bardale's— 45%  
 Empire— 50%  
 Pullman— 50%

**File and Tool—**  
 Nicholson File Holders and File Handles— 33 1/2% to 40%

**Fruit Jar—**  
 Triumph Fruit Jar Holder, doz. gross, \$10.95; doz. \$1.25

**Hones—Razor—**  
 Pike Mfg. Co., Belgian, German and Swat— 50%

**Hooks—Cast Iron—**  
 Bird Cage, Reading— 40%  
 Bird Cage, Sargent's List, Nos. 22, 23, 12, 13, 13 and 13S— 50¢ to 1.00  
 Clothes Line, Reading List— 40%  
 Clothes Line, Sargent's List— 50¢ to 1.00  
 Coat and Hat, Sargent's List— 50¢ to 1.00  
 Clothes Line, Stowell's— 70%  
 Coat and Hat, Reading— 45¢ to 20¢  
 Coat and Hat, Stowell's— 65%  
 Coat and Hat, Wrightsville— 65%  
 Harness, Reading List— 40%  
 Harness, Stowell's— 60%  
 School House, Stowell's— 70%

**Wire—**  
 Belt— 80¢ to 1.00  
 Wire C. & H. Hooks— 75¢ to 1.00  
 Columbian Hdw Co., Gem— 70¢ to 1.00  
 Parker Wire Goods Co., King— 75¢ to 1.00  
 Van Wagner, Coat and Hat— 70%  
 Western W. G. Co. Molding— 75%  
 Wire Goods Co.:  
 Acme— 60¢ to 1.00  
 Chief— 70%  
 Crown— 75%  
 Czar— 65%  
 V Brace— 75%  
 Czar Harness— 50¢ to 1.00

**Wrought Iron—**  
 Box, 6 in., per doz. \$1.00; 8 in., \$1.25; 10 in., \$2.50.  
 Cotton— doz. \$1.05 to \$1.25  
 Wrought Staples, Hooks, etc.— See Wrought Goods.

**Miscellaneous—**  
 Hooks, Bench, see Stops, Bench.  
 Bush, Light, doz. \$1.75; Medium, \$5.35; Heavy, \$6.25  
 Grass, best, all sizes, per doz. \$1.50  
 Grass, common grades, all sizes, per doz. \$1.39  
 Wiretree— 1b. 5¢ to 6¢  
 Hooks and Eyes:  
 Brass— 60¢ to 1.00  
 Malleable Iron— 70¢ to 1.00  
 Covert Mfg. Co. Gate and Seattle Hooks— 25%  
 Covert Saddlery Works' Self Locking Gate and Door Hook— 60%  
 Ft. Madison Cut-Easy Corn Hooks— doz. \$3.35 net  
 Bench Hooks— See Bench Stops.  
 Corn Hooks— See Knives, Corn.

**Horse Nails—**  
 See Nails, Horse.

## Horseshoes—

See Shoes, Horse.

## Hose, Rubber—

Garden Hose, 1/2-inch:

Competition— ft. 5 @ 6¢

3-ply Standard— ft. 8 @ 9¢

4-ply Standard— ft. 10 @ 11¢

3-ply extra— ft. 11 @ 13¢

4-ply extra— ft. 14 @ 16¢

Cotton Garden, 1/2-in., coupled:

Low Grade— ft. 8 @ 9¢

Fair Quality— ft. 10 @ 11¢

**Irons— Sad—**

From 1/4 to 10— 1b. 3 1/4¢

B. B. Sad Irons— 1b. 3 1/4¢

Chinese Laundry— 1b. 3 1/4¢

Chinese Sad— 1b. 4 @ 4 1/4¢

Mrs. Potts', cents per set:

Nos. 50 55 60 65

Jap'd Tops— 62 59 72 69

Tin'd Tops— 65 62 75 72

New England Pressing, 1b. 3 1/4¢

**Pinking—**

Pinking Irons— doz. 50¢ to 60¢

**Irons, Soldering—**

See Coppers.

**Jacks, Wagon—**

Covert Mfg. Co.:  
 Auto Screw— 30¢ to 2¢  
 Steel— 45%

Covert's Saddlery Works:  
 60¢ to 10¢

Victor— 50%

Lockport— 50%

Lane's Steel— 30¢ to 1.00

Richards' Tiger Steel, No. 130— 50¢ to 1.00

Smith & Hemenway Co.'s— 25%

**Kettles—**

Brass, Spun, Plain— 20¢ to 25%

Enamelled and Cast Iron— See Ware, Hollow.

**Knives—**

Butcher, Kitchen, &c.—

Foster Bros' Butcher, &c.— 30%

Wilkinson Shear & Cutlery Co.— 50%

**Corn—**

Withington Acme— doz. \$2.65

Doit, \$2.75; Adj. Serrated, \$2.20

Serrated, \$2.10; Yankee No. 1, \$1.50

Yankee No. 2, \$1.15

**Drawing—**

Standard List— 75¢ to 1.00

C. E. Jennings & Co., Nos. 45, 46, 60

Jennings & Griffin, Nos. 41, 42— 50%

Ohio Tool Co.'s— 70%

Swan's— 75%

Watrous— 15%

L. & J. White— 20¢ to 25%

**Hay and Straw—**

Serrated Edge, per doz. \$5.25 to \$5.50

Ivan's Sickle Edge— doz. \$9.50

Ivan's Serrated— doz. \$10.00

**Mincing—**

Buffalo— doz. \$13.00

**Miscellaneous—**

Farmers'— doz. \$3.00 to \$3.25

Wostenholm's— doz. \$3.00 to \$3.25

**Knobs—**

Base, 1/2-inch, Birch, or Maple, Rubber top— gro. \$1.15 to \$1.20

Carriage, Jap., all sizes— gro. 40¢ to 54¢

Door, Mineral— doz. 65¢ to 70¢

Door, Por. Jap'd— doz. 70¢ to 75¢

Door, Por. Nickel— doz. \$2.05 to \$2.15

Bardale's Wood Door, Shutters, &c. 15%

Picture, Sargent's— 60¢ to 1.00

**Lacing, Leather—**

See Belting, Leather.

**Ladders, Store, &c.—**

Lane's Store— 25%

Myers' Noiseless Store Ladders— 50%

Richards Mfg. Co.:  
 Improved Noiseless, No. 112— 50%  
 Climax Shelf, No. 113— 50%  
 Trolley, No. 109— 50%

**Ladies, Melting—**

L. & G. Mfg. Co. (low list)— 35%

P. S. & W.— 50%

Reading— 60%

Sargent's— 50¢ to 1.00

**Lanterns— Tubular—**

Regular Tubular, No. 0— doz. \$1.25 to \$1.65

Lift Tubular, No. 0— doz. \$1.50 to \$1.15

Hinge Tubular, No. 0— doz. \$1.50 to \$1.15

Other Styles— 1.00 to 1.00

**Bull's Eye Police—**

No. 1, 2 1/2-inch— \$2.50 to \$2.75

No. 2, 3-inch— \$2.75 to \$3.00

**Lasts and Stands, Shoe—**

Stowell's Atlas, Malleable Iron— 50%

Stowell's Badger, Cast Iron— 50%

**Latches— Thumb—**

Roggin's Latches, with screw— doz. 35¢ to 40¢

**Door—**

Cronk & Carrier Mfg. Co., No. 161— doz. \$2.30

Cronk & Carrier Mfg. Co., Latch, Hasp and Staples— 50%

Richards' Bull Dog, Heavy, No. 125— 50%

Richards' Trump, No. 127— \$1.50

**Leaders, Cattle—**

Small— doz. 50¢; large, 60¢

Covert Mfg. Co., Cotton and Hemp— 45%

**Lifters, Transom—**

R. & E.— 33 1/2%

**Lines—**

Wire Clothes, Nos. 15 19 20 20

100 feet— \$2.20 2.00 1.70

75 feet— \$1.80 1.70 1.30

Samson Cordage Works:  
 Solid Braided Chalk, Nos. 0 to 3.40— \$6.00  
 Silver Lake Braided Chalk, No. 0, \$6.00  
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50  
 Mason's Lines, Shade Cord— 25%  
 White Cotton, No. 3 1/2, \$1.50; No. 4, \$2.00

\$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75; Linen, No. 3 1/2, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50; Colors, No. 5, \$2.00; Tent and Awning Lines, No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50  
 Clothes Lines, White Cotton: 50 ft. \$2.75; 60 ft. \$3.25; 70 ft. \$3.75; 75 ft. \$4.00; 80 ft. \$4.25; 90 ft. \$4.75; 100 ft. \$5.25  
 Anniston Waterproof Clothes, 50 ft. \$7.00; 60 ft. \$8.00; 70 ft. \$9.00; 80 ft. \$10.00; 90 ft. \$11.00; 100 ft. \$12.00; 110 ft. \$13.00; 120 ft. \$14.00; 130 ft. \$15.00; 140 ft. \$16.00; 150 ft. \$17.00; 160 ft. \$18.00; 170 ft. \$19.00; 180 ft. \$20.00; 190 ft. \$21.00; 200 ft. \$22.00  
 Line, \$22.00; Acme, \$17.00; Alabama, \$15.00; Empire, \$14.00; Advance, \$13.00; Oriole, \$12.00; Albemarle, \$11.00; Eclipse, \$10.00; Chicago, \$9.00; Standard, \$8.00; Columbia, \$7.00; Allston, \$6.00; Calhoun, \$5.00

**Locks— Cabinet—**

Cabinet Locks— \$3 1/2 to \$3 1/4 to \$7 1/2

**Door Locks, Latches, &c.—**

NOTE—Net Prices are very often made on these goods.

Reading Hardware Co.— 40%

R. & E. Mfg. Co.— 40%

Sargent & Co.— 40%

Stowell's Steel Door Latches— 50%

**Elevator—**

Stowell's— 50%

**Padlocks—**

Wrought Iron— 75¢ to 1.00

R. & E. Mfg. Co. Wrought Steel and Brass— 75¢ to 1.00

**Sash, &c.—**

Ives' Patent:  
 Bronze and Brass— 62 1/2%  
 Crescent— 50% to 100%  
 Iron— 62 1/2%  
 Window Ventilating— 60%  
 Robinson Patent Ventilating— 50%  
 Lock— 40%  
 Wrought Bronze and Brass— 55%  
 Wrought Steel— 55%  
 Pullman Patent Ventilating Lock— 25%  
 Reading— 40%

**Machines—Boring—**

Com. Up'r't, without Augers \$2.00

Com. Ang'l'r, without Augers \$2.25

Swan's Improved— 40¢ to 1.00

Jennings' Nos. 1 and 4— 35¢ to 45¢

Miller's Falls— 5.75

Snell's, Rice's Pat. 2.50

Reisinger Invinible Hand Power— doz. \$48.00

**Fence—**

Williams' Fence Machines— each, \$5.50

**Hoisting—**

Moore's Anti-Friction Differential Pulley Block— 30%

Moore's Hand Hoist, with Lock— 20%

**Ice Cutting—**

Chandler's— 12 1/2%

**Washing—**

Boss Washing Machine Co.: Per doz. \$37.00

Boss No. 1— \$37.00

Boss Rotary— \$34.00

Champion Rotary Hammer No. 1— \$34.00

Standard Champion No. 1— \$34.00

Standard Perfection— \$30.00

Cint. Squire Western— \$30.00

Uneda American, Round— \$30.00

**Mallets—**

Hickory— 45¢ to 50%

Lignumvite— 45¢ to 50%

Tinners' Hickory and Applewood— doz. 45¢ to 50%

**Mangers, Stable—**

Swett Iron Works— 50%

**Mashers, Vegetable—**

Western, W. G. Co., Potato— 60¢ to 1.00

**Mats, Door—**

Elastic Steel (W. G. Co.), new list— 50¢ to 1.00

**Mattocks—**

See Picks and Mattocks.

**Milk Cans— See Cans, Milk.**

**Mills, Coffee, &c.—**

Enterprise Mfg. Co.— 25¢ to 30%

National list Jan. 1, 1902— 25%

Parker's Columbia & Victoria— 50¢ to 1.00

Parker Box and Sides— 50¢ to 1.00

Swift, Lane Bros. Co.— 30%

**Mowers, Lawn—**

NOTE—Net prices are generally quoted

Cheap— all sizes, \$1.85 to \$2.00

Cheap— all sizes, \$2.00 to \$2.50

Better Grade— all sizes, \$2.50 to \$4.50

High Grade— \$4.50 4.75 5.00 5.25



Slater's Felt (roll 500 sq. ft.) .75¢  
It. K. M. Stone Surfaced Roofing  
(roll 100 sq. ft.) .75¢

**Sand and Emery**  
Flint Paper and Cloth .50¢@1.00  
Garnet Paper and Cloth .25¢  
Emery Paper and Cloth .50¢@1.00

**Papers—Apple—**  
Advance .50 doz. \$4.00  
Baldwin .50 doz. \$4.00  
Bonanza Improved .50 doz. \$4.00  
Dandy .50 doz. \$4.00  
Eureka Improved .50 doz. \$4.00  
Family Bay State .50 doz. \$4.00  
Improved Bay State .50 doz. \$4.00  
Little Star .50 doz. \$4.00  
New Lightning .50 doz. \$4.00  
Reading 72 .50 doz. \$4.00  
Reading 78 .50 doz. \$4.00  
Rocking Table .50 doz. \$4.00  
Turn Table .50 doz. \$4.00  
White Mountain .50 doz. \$4.00

**Potato—**  
Saratoga .50 doz. \$7.00  
White Mountain .50 doz. \$6.00

**Picks and Mattocks—**  
List Feb. 23, 1899 .75¢@75¢  
Cronk's Handled Garden Mattock  
50 doz. \$6.40 .33¢

**Pinking Irons—**  
See Irons, Pinking.

**Pins, Escutcheon—**  
Brass .60¢@60¢  
Iron, list Nov. 11, '85 .60¢@60¢

**Pipe, Cast Iron Soil—**  
Carload lots.  
Standard, 2-6 in. .60¢  
Extra Heavy, 2-6 in. .70¢  
Fittings .75¢

**Pipe, Merchant—**  
Consumers, Carloads.  
Steel.  
Bk. Galv. Bk. Galv.  
1/4 & 1/2 in. .71¢ .55¢  
3/4 & 1 in. .75¢ .63¢  
1 & 1 1/2 in. .79¢ .67¢  
1 1/2 & 2 in. .74¢ .59¢  
2 & 2 1/2 in. .74¢ .59¢

**Pipe, Vitrified Sewer—**  
Carload lots.  
Standard Pipe and Fittings, 2  
to 24 in.:  
New England .68¢  
New York and New Jersey .71¢  
Maryland, Delaware, E. Pa. 75¢  
West Pa. and West Va. .77¢  
Virginia .76¢  
Ohio, Michigan and Ky. .77¢  
Indiana .77¢  
NOTE—Carload lots are generally delivered.

**Pipe, Stove—**  
Edwards' Nested Stove Pipe:  
C. L. L. C. L.  
5 in., per 100 joints .70¢ .80¢  
6 in., per 100 joints .75¢ .85¢  
7 in., per 100 joints .85¢ .95¢

**Planes and Plane Irons—**  
Wood Planes—  
Bench, first qual. .40¢@1.00  
Bench, second qual. .50¢@1.00  
Molding .33¢@1.00  
Bailey's (Stanley R. & L. Co.) .40¢  
Chapin-Stephens Co.:  
Bench, first quality .40¢@1.00  
Bench, second quality .50¢@1.00  
Molding .33¢@1.00  
Toy and German .40¢@1.00  
Chapin's .60¢  
Ohio Tool Co.:  
Bench, first quality .40¢@1.00  
Bench, second quality .50¢@1.00  
Molding .33¢@1.00  
Adjustable Wood Bottom .60¢  
Union .60¢

**Iron Planes—**  
Bailey's (Stanley R. & L. Co.) .40¢  
Chapin's Iron Planes .50¢@1.00  
Miscellaneous Planes (Stanley R. & L. Co.) .40¢  
Ohio Tool Co.'s Iron Planes .60¢  
Sargent's .60¢@1.00  
Union .60¢

**Plane Irons—**  
Wood Bench Plane Irons .25¢@1.00  
Buck Bros. .30¢  
Chapin-Stephens Co. .30¢@1.00  
Ohio Tool Co. .30¢  
Stanley R. & L. Co. .30¢  
Union .50¢  
L. & I. J. White .20¢@25¢

**Planters, Corn, Hand—**  
Kohler's Eclipse .50 doz. \$3.00

**Plates—**  
Felloe .10¢  
Self-Sealing Pie Plates (S. S. & Co.) .50 doz. \$2.00

**Pliers and Nippers—**  
Button Pliers .75¢@1.00  
Gas Burner, per doz. 5 in., \$1.25  
@ \$1.30; 6 in., \$1.45 @ \$1.50.  
Gas Pipe .7 8 10 12 in.  
\$2.00 \$2.25 \$3.00 \$3.75  
Acme Nippers .50¢  
Cronk & Carrier Mfg. Co.:  
American Button .75¢@1.00  
Cronk's .60¢  
Stub's Pattern .60¢  
Combination and others .33¢  
Heller's Farriers' Nippers, Pincers  
and Tools .40¢@1.00  
The Nettleton Mfg. Co. Reversible  
Cutting Nippers .60¢  
P. S. & W. Finners' Cutting Nip-  
pers .40¢  
Swedish Side, End and Diagonal Cut-  
ting Pliers .80¢  
Utica Drop Forge & Tool Co.:  
Pliers and Nippers, all kinds .40¢

**Plumbs and Levels—**  
Chapin-Stephens Co.:  
Plumbs and Levels .30¢@1.00  
Chapin's Imp. Brass Cor. 10¢@1.00  
Pocket Levels .30¢@1.00  
Diston's Plumbs and Levels .75¢

Diston's Pocket Levels .10¢  
C. E. Jennings & Co.'s Iron, Adjust-  
able .40¢@1.00  
Stanley R. & L. Co. .45¢  
Stanley's Duplex .35¢  
Woods' Extension .33¢

**Poachers, Egg—**  
Buffalo Steam Egg Poachers, 50 doz.  
No. 1, \$6.00; No. 2, \$9.00; No. 3,  
\$9.00; No. 4, \$12.00 .50¢

**Points, Glaziers—**  
Bulk and 1-lb. papers, 1 lb. 8¢@9¢  
1/2-lb. papers .10¢  
1/4-lb. papers .10¢

**Pokes, Animal—**  
Ft. Madison Hawkeye .50 doz. \$3.25  
Ft. Madison Western .50 doz. \$4.00

**Police Goods—**  
Manufacturers' Lists .25¢@25¢  
Tower's .25¢

**Polish—Metal, Etc—**  
Glasbrite, No. 2, 5 lb can (powder),  
each, \$1.25; 50 doz. \$12.00; No. 10 lb  
can (cake), each, \$2.50; 50 doz. \$24.00.  
Prestoline Liquid, No. 1 (1/2 qt.) .50  
doz. \$3.00; No. 2 (1 qt.) .50 doz. \$3.00  
Prestoline Paste .40¢  
George William Hoffman:  
U. S. Metal Polish Paste, 3 oz.  
boxes, 50 doz. \$5.00; 50 gro. \$4.50;  
1 lb boxes, 50 doz. \$1.25; 1 lb  
boxes, 50 doz. \$2.25  
U. S. Liquid, 8 oz. cans, 50 doz.,  
\$1.25; 50 gro. \$12.00  
Barkeepers' Friend Metal Polish, 50  
doz., \$1.75; 50 gro. \$18.00  
Wynn's White Silk, 1/2 pt. cans, 50  
doz. \$2.00

**Stove**  
Black Eagle Benzine Paste, 5 lb cans,  
each, \$1.00; 50 doz. \$5.00  
Black Eagle, Liquid, 1/2 pt. cans,  
50 doz. \$7.50  
Black Jack Paste, 1/2 lb cans, 50 gr. \$9.00  
Black Kid Paste, 1/2 lb cans, 50 gr. \$9.00  
Ladd's Black Beauty Liquid, per  
100 tins .50¢  
Joseph Dixon's, 50 gr. \$5.75 .10¢  
Dixon's Plumbago .50 gr. \$2.50  
Firemade .50 gr. \$4.50 .10¢  
Japanese .50 gr. \$3.50  
Jet Black .50 gr. \$3.50  
Peerless Iron Enamel, 10 oz. cans,  
50 doz. \$1.50

**Poppers, Corn—**  
1 qt., Square .50 doz. \$9.00  
1 qt., Round .50 doz. \$10.00  
1/2 qt., Square .50 doz. \$11.00  
2 qt., Square .50 doz. \$13.00

**Post Hole and Tree Au-  
gers and Diggers—**  
See also Diggers, Post Hole, &c.

**Posts, Steel—**  
Steel Fence Posts, each, 5 ft. 4¢;  
6 ft. 4¢; 6 1/2 ft. 4¢  
Steel Hitching Posts .each \$1.30

**Potato Parers—**  
See Parers, Potato.

**Pots, Glue—**  
Enamelled .40¢  
Tinned .35¢

**Powder—**  
In Canisters:  
Duck, 1 lb. .each 45¢  
Fine Sporting, 1 lb. .each 75¢  
Rifle, 1/2 lb. .each 15¢  
Rifle, 1 lb. .each 25¢  
In Kegs:  
12 1/2-lb. kegs .each \$3.50  
25-lb. kegs .each \$4.50  
King's Semi-Smokeless:  
Keg (25 lb bulk) .each \$6.50  
Half Keg (12 1/2 lb bulk) .each \$3.50  
Quarter Keg (6 1/2 lb bulk) .each \$1.90  
Case 24 (1 lb cans bulk) .each \$4.50  
Half case (1 lb cans bulk) .each \$4.50  
King's Smokeless:  
Keg (25 lb bulk) .each \$12.00 \$15.00  
Half Keg (12 1/2 lb bulk) .each 6.25 7.75  
Quarter Keg (6 1/2 lb bulk) .each 3.25 4.00  
Case 24 (1 lb cans bulk) .each 14.00 17.00  
Half case 12 (1 lb c. bk.) .each 7.25 8.75  
Robin Hood Shot Gun .75¢@2.75

**Presses—**  
Fruit and Jelly—  
Enterprise Mfg. Co. .20¢@25¢

**Seal Presses—**  
Morrill's No. 1, 50 doz. \$20.00 .50¢  
**Pruning Hooks and Shears**  
See Shears.

**Pullers, Cork—**  
Invincible Cork Puller .each \$21.00

**Pullers, Nail—**  
Cyclops .50¢  
Miller's Falls, No. 3, 50 doz. \$12.00 .50¢  
Morrill's No. 1, Nail Puller, 50 doz.  
\$30.00 .50¢  
Pearson No. 1, Cyclone Spike Puller,  
each \$30.00 .50¢  
Pelican, 50 doz. \$9.00 .50¢  
Scranton, Case Lots:  
No. 2B (large) .each \$5.50  
No. 3B (small) .each \$5.00  
Smith & Hemenway Co.:  
Diamond B. No. 2, case lots .each \$6.00  
Diamond B. No. 3, case lots .each \$5.50  
Giant No. 1, 50 doz. \$18.00 .50¢  
Staple Pullers .each \$3.00 .50¢  
Parrot Tack and Stub Puller, 50  
doz. \$7.50 .50¢

**Pulleys, Single Wheel—**  
Inch .1 1/2 2 3  
Acning or Tackle .50  
doz. \$9.30 .50¢  
Hay Fork, Sicel or Solid Eye,  
doz., 4 in., \$1.25; 5 in., \$1.55

Inch .2 2 1/2 3  
Hot House, doz. \$9.65 .50¢  
Inch .1 1/2 2 3  
Screw, doz. \$9.16 .50¢  
Inch .1 1/2 2 3  
Side, doz. \$9.25 .50¢  
Inch .1 1/2 2 3  
Stowells:  
Crutcher or End, Anti-Friction .60¢@1.00  
Dumb Waiter, Anti-Friction .60¢@1.00  
Electric Light .60¢  
Side, Anti-Friction .60¢@1.00

**Sash Pulleys—**  
Common Frame; Square or  
Round End, per doz. 1 1/2 and  
2 in. .16¢@19¢  
Auger Mortise, no Face Plate,  
per doz. 1 1/2 and 2 in. .16¢@19¢  
Acme .1 1/2 in., 16¢; 2 in., 19¢  
Fox-All-Steel, Nos. 3 and 7, 2 in. .19¢

Grand Rapids All Steel Noiseless .50¢  
Ideal .50¢  
Niagara .1 1/2 in., 16¢; 2 in., 19¢  
No. 26, Troy .1 1/2 in., 14¢; 2 in., 16¢  
Star .1 1/2 in., 16¢; 2 in., 19¢  
Tackle Blocks—See Blocks.

**Pumps—**  
Cistern .60¢@60¢  
Pitcher Spout .80¢@80¢  
Wood Pumps, Tubing, &c. .45¢@50¢  
Barnes Dbl. Acting (low list) .50¢  
Barnes Pitcher Spout .75¢@10¢  
Contractors' Rubber Diaphragm No.  
2, B. & L. Block Co. .51¢  
Daisy Pump .50¢  
Flint & Walling's Fast Mail Hand  
(low list) .55¢  
Flint & Walling's Fast Mail (low  
list) .55¢  
Flint & Walling's Tight Top Pitcher .50¢  
National Specialty Mfg. Co., Measur-  
ing .50¢  
Mechanical Sprayer .50¢  
Myers' Pumps (low list) .50¢  
Myers' Power Pumps .50¢  
Myers' Spray Pumps .50¢@10¢

**Pump Leathers—**  
Plunger and Lower Valve—Per  
gro.:  
Inch .2 2 1/2 3 3 1/2 4  
\$2.20 2.50 2.75 3.00  
Inch .3 3 1/2 3 3 1/2 4  
\$3.30 3.60 3.85 4.10 4.40

**Punches—**  
Saddlers' or Drive, good .50¢  
Spring, single tube, good qual-  
ity .75¢@8.00  
Revolving (4 tubes) .50¢@3.75

Bemis & Call Co.'s Cast Stl Drive .50¢  
Bemis & Call Co.'s Check .50¢  
Morrill's No. 1AA, 1A, 1B, 1C,  
15.00 .50¢  
Hercules, 1 die, each \$5.00 .50¢  
Niagara Hollow Punches .50¢@1.00  
Niagara Solid Punches .50¢@1.00  
Steel Screw, B. & K. Mfg. Co. .50¢  
Timmer's Hollow P. S. & W. Co. .50¢  
Timmer's Solid P. S. & W. Co. .50¢  
doz., \$1.41 .60¢

**Rail—Barn Door, &c.—**  
Sliding Door, Painted Iron .2 1/2¢@2 1/2¢  
Sliding Door, Wrought Brass,  
1 1/2 in., 10, 36¢ .30¢

Albion Mfg. Co.:  
No. 1, Reliable Hgr. Track, 50 ft. 5 1/2¢  
No. 2, Reliable Hgr. Track, 50 ft. 7¢  
Cronk's:  
Double Braced Steel Rail, 50 ft. 2 1/2¢  
O. N. T. Rail .2 1/2¢  
Griffin's:  
xxx, 100 ft. 1 x 3-16 in. \$3.00;  
1 1/4 x 3-16 in. 3.50;  
Hinged Hanger, 100 ft. 1 x 3-16  
in. \$3.10; 1 1/4 x 3-16 in. \$3.60.  
Lane's:  
Hinged Track, 100 ft. 1 in., \$3.40;  
1 1/4 in., \$4.10.  
O. N. T., 100 ft. 1 in., \$2.75; 1 1/4  
in., \$3.50; 1 1/2 in., \$4.00.  
Standard, 100 ft. 100 ft. \$4.00  
Lawrence Bros.:  
100 ft. No. 201, \$4.00; No. 202, \$4.00  
New York, 1 x 3-16 in., 100 ft. \$2.75  
McKinney's:  
Hinged Hanger Rail, 50 ft. 11¢ .50¢  
None Better .50¢  
Sewell's .50¢  
Myers' Stay Track .60¢@1.00  
Richards' Mfg. Co.:  
Common 1 x 3-16 in. \$2.25; 1 1/4 x  
3-16, \$2.50; 1 1/2 x 3-16, \$2.75.  
Special Hinged Hanger Rail .60¢@1.00  
Lag Screw Rail, No. 65 .50¢  
Gauge Trolley Track, No. 35, 30¢  
9 1/2 x No. 32, 14¢; No. 35, 20¢  
Safety Door Hanger Co.'s Storm  
King Safety .60¢  
Safety Door Hanger Co.'s U. S.  
Standard .60¢  
Stowell's:  
Cast Rail .50¢  
Steel Rail, Plain .50¢  
Wrought Bracket, 1 1/2 x 5-16 .50¢  
Wrought Bracket, 1 1/2 x 5-16 .50¢  
Swett's Hyllo, 50 ft. 11¢ .60¢  
P. L. R. Steel Rail .50¢  
No. 6, 1 x 3-16 .50¢  
No. 7, 1 x 3-16 .50¢

**Rakes—**  
NOTE.—Manufacturers are  
selling from the list of September  
1, 1904, but many jobbers are still  
using list of August 1, 1899, or  
selling at net prices.

Fort Madison Red Head Lawn .35¢  
Fort Madison Blue Head Lawn .35¢  
Jackson Lawn, 20 and 30 teeth, 50  
doz., net. \$4.25  
Cronk's:  
New Champion Garden, 50 doz., 12  
teeth, \$15.00; 14, \$16.50; 16, \$18.00 .75¢  
Victor Garden, 50 doz., 12 teeth,  
\$15.00; 14, \$16.50; 16, \$18.00 .75¢  
Queen City Lawn, 50 doz., 20 teeth,  
\$3.45; 24, \$3.60 .50¢

**Rings and Ringers—**  
Hill's Rings, gro. boxes, \$4.00@4.50  
Hill's Ringers, Gray Iron .50¢@55¢  
Hill's Ringers, Malleable Iron .50¢@55¢  
Blair's Ringers .per pro. \$4.75@5.25  
Blair's Ringers, per doz. \$6.00@6.50  
Brown's Ringers .per doz. \$5.00@5.50  
Brown's Ringers, per doz. \$6.00@6.50

**Rivets and Burrs—**  
Copper .50¢@1.00  
Iron or Steel .75¢@75¢

**Rollers—**  
Acme, Stowell's Anti-Friction .50¢  
Barn Door, Sargent's list .60¢  
Cronk's Brake No. 65, \$9.90; No.  
50 .50¢  
Cronk's Brinkerhoff No. 50 .50¢  
No. 56 .50¢  
Lane's Stay .40¢  
Richards' Stay:  
Handy Adj. and Reversible No. 53, 75¢  
O. K. Adj. and Reversible No. 58, 50¢  
Lag Screw, Nos. 55 and 57 .50¢  
Underwriters, Nos. 59, 60 .50¢  
Favorite, No. 64 .60¢  
Stowell's Barn Door Stay, 50 doz. \$1.00  
Swett's Anti-Friction .50¢  
Screw and Spike Stay .50¢  
Hinge Adjustable Stay .50¢

**Rope—**  
Manila, 7-16 in. diam. and larger:  
Pure .10¢  
Sisal, 7-16 in. diam. and larger:  
Pure .10¢  
Sisal, 7-16 in. diam. and larger:  
No. 2 quality .10¢  
Sisal, Hay, Hide and Bale  
Ropes, Medium and Coarse:  
Mixed .10¢  
Pure .10¢  
Sisal, Tarred, Medium Lath  
Tarn, Coarse and Untarred:  
Mixed .10¢  
Pure .10¢  
Best, 1/4-in. and larger .15¢  
Medium, 1/4-in. and larger .15¢  
Common, 1/4-in. and larger .10¢  
In coils, 1/4¢ advance.

**Wire Rope—**  
Galvanized .37¢@2.10¢  
Plain .45¢@2.10¢

Anticlog Lawn, 50 doz. \$1.00  
Malleable Garden .70¢@1.00  
Kohler's:  
Lawn Queen, 20-tooth .50 doz. \$5.45  
Lawn Queen, 24-tooth .50 doz. \$5.60  
Paragon, 20-tooth .50 doz. \$2.75  
Paragon, 24-tooth .50 doz. \$3.00  
Steel Garden, 14-tooth .50 doz. \$2.40  
Malleable Garden, 14-tooth .50 doz. \$1.50  
Weldless Steel Garden .75¢@1.00

**Rasps, Horse—**  
Diston's .75¢  
Heller Bros. .70¢@70¢  
McCaffrey's American St'd .60¢@10¢  
New Nicholson .70¢@10¢  
See also Files.

**Razors—**  
Boras—I C. .60¢  
Fox Razors, No. 42 .50 doz. \$20.00  
Fox Razors, No. 41 .50 doz. \$20.00  
Fox Razors, No. 82, Platina .50¢  
Red Devil .50¢  
Silberstein:  
Carbo Magnetic .50¢  
Griffin, No. 65 .50¢  
Griffin, No. 60 .50¢  
All other Razors .50¢

**Safety Razors—**  
Silberstein .40¢

**Reels, Fishing—**  
Hendrix:  
M. Q. 8, A. B. 6, M. 9, M. 16,  
Q. 16, A. 16, B. 16, 4008, Rubber,  
Populo, Nickelodeo Populo .20¢  
Aluminum, German Sil., Bronze .25¢  
1240 N. 124 N. .20¢  
3004 N. 304 N. 304 N. 304 N. .20¢  
4 N. 6 PN, 24 N. 24 PN .20¢  
2004 P. .20¢  
2004 PN .20¢  
0224 N .20¢  
0224 N .20¢  
0224 N .20¢  
0224 N .20¢  
966 PN, 2004 N, 974 PN .20¢  
3009 PN, 5009 N .20¢  
Competitor 102 P, 102 PN, 202 P,  
202 PN, 102 PR, 202 PR .20¢  
304 P, 304 PN, 3004 P, 3004 PN .20¢

**Registers—List July 1, 1903.**  
Japanned, Electroplated and  
Bronzed .70¢@1.00  
Bronzed .75¢

**Revolvers—**  
Single Action .95¢@1.00  
Double Action, except 44 cal. \$1.85  
Double Action, 44 caliber .82¢  
Automatic .84¢  
Hammerless .each \$1.00  
Thayer Robertson & Cary:  
Automatic .each \$2.75  
Hammerless .each \$3.25

**Riddles, Hardware Grade**  
16 in. .per doz. \$2.25@2.50  
17 in. .per doz. \$2.50@2.75  
18 in. .per doz. \$2.75@3.00

**Rings and Ringers—**  
Bull Rings—  
Steel .80¢  
Copper \$1.00  
Rea's Improved Self-Piercing Cup-  
per, 2 in., 100, \$1.25; 2 1/2 in.,  
150; 3 in., \$1.75.

**Hog Rings and Ringers—**  
Hill's Rings, gro. boxes, \$4.00@4.50  
Hill's Ringers, Gray Iron .50¢@55¢  
Hill's Ringers, Malleable Iron .50¢@55¢  
Blair's Ringers .per pro. \$4.75@5.25  
Blair's Ringers, per doz. \$6.00@6.50  
Brown's Ringers .per doz. \$5.00@5.50  
Brown's Ringers, per doz. \$6.00@6.50

**Rivets and Burrs—**  
Copper .50¢@1.00  
Iron or Steel .75¢@75¢

**Rollers—**  
Acme, Stowell's Anti-Friction .50¢  
Barn Door, Sargent's list .60¢  
Cronk's Brake No. 65, \$9.90; No.  
50 .50¢  
Cronk's Brinkerhoff No. 50 .50¢  
No. 56 .50¢  
Lane's Stay .40¢  
Richards' Stay:  
Handy Adj. and Reversible No. 53, 75¢  
O. K. Adj. and Reversible No. 58, 50¢  
Lag Screw, Nos. 55 and 57 .50¢  
Underwriters, Nos. 59, 60 .50¢  
Favorite, No. 64 .60¢  
Stowell's Barn Door Stay, 50 doz. \$1.00  
Swett's Anti-Friction .50¢  
Screw and Spike Stay .50¢  
Hinge Adjustable Stay .50¢

**Rope—**  
Manila, 7-16 in. diam. and larger:  
Pure .10¢  
Sisal, 7-16 in. diam. and larger:  
Pure .10¢  
Sisal, 7-16 in. diam. and larger:  
No. 2 quality .10¢  
Sisal, Hay, Hide and Bale  
Ropes, Medium and Coarse:  
Mixed .10¢  
Pure .10¢  
Sisal, Tarred, Medium Lath  
Tarn, Coarse and Untarred:  
Mixed .10¢  
Pure .10¢  
Best, 1/4-in. and larger .15¢  
Medium, 1/4-in. and larger .15¢  
Common, 1/4-in. and larger .10¢  
In coils, 1/4¢ advance.

**Wire Rope—**  
Galvanized .37¢@2.10¢  
Plain .45¢@2.10¢

**Ropes, Hammocks—**

Covert Mfg. Co.:.....	60%
Jute.....	30%10
Sisal.....	30%10
Covert Saddlery Works.....	60%5

**Rulers, Desk—**

Simpson & Son:.....	30%10
Boxwood and Maple.....	30%10

**Rules—**

Boxwood.....	60%10
Ivory.....	35%10

Chapin-Stephens Co.:.....	60%10
Boxwood.....	60%10

Flexfold.....	27%10
Ivory.....	30%10

Miscellaneous.....	50%10
Combination.....	55%10

Stationers.....	10%10
Kouff & Easer Co.:.....	35%10

Folding, Wood.....	35%10
Folding, Steel.....	30%10

Larkin's Steel.....	50%10
Larkin's Lumber.....	60%

Stanley R. & L. Co.:.....	62%
Boxwood.....	45%

Ivory.....	45%
Miscellaneous.....	40%

Zig Zag, Pin Joint.....	42%10
Union Nut Co.:.....	60%10

Boxwood.....	60%10
Ivory.....	35%10

**Sash Balances—**

See Balance, Sash.

**Sash Locks—**

See Locks, Sash.

**Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers**

See Stuffers or Fillers, Sausage.

**Saw Frames—**

See Frames, Saw.

**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Saws—**

Atkins:.....	50%
Circular.....	50%

Band.....	50%10
Cross Cuts.....	50%

Mulay, Mill and Drag.....	50%
One-Man Saw.....	50%

Wood Saws.....	40%
Zig Zag, Compass &c.....	40%

Chapin-Stephens Co.:.....	30%10
Turning Saws and Frames.....	30%10

Diamond Saw & Stamping Works.....	30%10
Sterling Kitchen Saws.....	30%10

Diston's:.....	50%
Circular, Solid and Ins'ted Tooth.....	50%

Band, 2 to 14 in. wide.....	60%
Band, 3/4 to 1 1/2.....	60%

Crosscuts.....	60%
Narrow Crosscuts.....	60%

Mulay, Mill and Drag.....	50%
Framed Woodsaws.....	35%

Woodsaw Blades.....	35%
Woodsaw Rods.....	25%

Hand Saws, Nos. 12, 19, 9, 16, 3109.....	25%
18, 120, 76, 17, 9, 107 1/2.....	25%

0, 00, Combination.....	30%
Compass, Key Hole, &c.....	25%

Butcher Saws and Blades.....	35%
C. E. Jennings & Co.'s:.....	35%

Back Saws.....	30%
Butcher Saws.....	30%

Compass and Key Hole Saws.....	35%
Framed Wood Saws.....	30%

Hand Saws.....	30%
Wood Saw Blades.....	35%

Millers Falls.....	15%10
Butcher Saws.....	15%10

Star Saw Blades.....	30%
Peace & Richardson's Hand Saws.....	30%

Simonds:.....	50%
Circular Saws.....	50%

Crescent Ground Cross Cut Saws.....	35%
One-Man Cross Cuts.....	40%10

Gang Mill, Mulay and Drag Saws.....	50%
Band Saws.....	50%

Hand Saws.....	25%10
Butcher Saws.....	25%10

Hand Saws.....	25%10
Hand Saws, Bay State Brand.....	45%

Compass, Key Hole, &c.....	25%10
Wood Saws.....	30%10

Springfield Mach. Screw Co.:.....	40%10
Diamond Kitchen Saws.....	40%10

Butcher Saws.....	35%10
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....	50%

Hack Saws—	
Atkins' Hack Saw Blades A & A.....	35%

Diston's:.....	25%
Concave Blades.....	40%

Keystone.....	40%
Hack Saw Frames.....	30%

Fitchburg File Works, The Best.....	35%
C. E. Jennings & Co.'s.....	40%

Hack Saw Frames, Nos. 175, 120.....	40%10
Hack Saws, Nos. 175, 120, complete.....	40%10

Goodell's Hack Saw Blades.....	40%
Griffin's Hack Saw Frames.....	35%10

Griffin's Hack Saw Blades.....	35%10
Springfield Mach. Screw Co.:.....	35%

Diamond Hack Saw Blades.....	35%
Diamond Hack Saw Frames.....	50%

Star Hack Saws and Blades.....	15%10
Sterling Hack Saw Blades.....	30%10

Sterling Hack Saw Frames.....	30%10
Sterling Power Hack Saw Machines.....	25%

each, No. 1, 2, 3, 4, 5.....	25%
Victor Hack Saw Blades.....	25%

Victor Hack Saw Frames.....	40%
Scroll—	

Barnes' No. 7, 115.....	25%
Barnes' Scroll Saw Blades.....	40%

Barnes' Velociped Power Scroll Saw.....	115
without boring attachment.....	115

with boring attachment.....	115
Latest, complete.....	115

Rogers, complete.....	115
Scalers, Fish—	

Covert's Saddlery Works.....	60%10
Scales—	

Family, Turnbull's.....	50%10
Counter.....	50%

Hatch, Platform, 1/4 oz. to 5 lbs.....	35.50
Two Platforms, 1/4 oz. to 5 lbs.....	35.50

100 lbs.....	115.00
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**Union Platform, Plain \$1.70@1.90**

Union Platform, \$1.70@1.90	
Chatillon's:.....	25%

Eureka.....	40%
Favorite.....	40%

Crocker's Trip Scales.....	50%
Chicago Scale Co.:.....	50%

The "Little Detective".....	25%10
Union or Family No. 2.....	60%

Portable Platform (reduced list).....	50%
Wagon or Stock (reduced list).....	35%10

"The Standard" Portables.....	50%
"The Standard" R. R. and Wagon.....	50%

Scrapers—	
Box, 1 Handle.....	25%10

Box, 2 Handle.....	25%10
Ship.....	25%10

Adjustable Box Scraper (S. R. & L. Co.).....	15%
Chapin-Stephens Co., Box.....	30%10

Screens, Window and Frames—	
Air Line Pattern Screens.....	60%10

Flyer Pattern Screens.....	60%10
Maine Screen Frames.....	10%10

Perfection Screens.....	60%10
Phillips' Screen Frames.....	60%10

See also Doors.	
Screens—Bench and Hand	

Bench, Iron, doz., 1 in.....	25%10
2 1/2; 1 1/2, \$3.00@3.25; 1 1/4, \$3.50@3.75	

Bench, W'd. Beech, doz.....	30%10
Hand, Wood.....	30%10

R. Bliss Mfg. Co., Hand.....	30%10
Chapin-Stephens Co., Hand.....	30%10

Ohio Tool Co., Bench and Hand.....	30%
Coach, Lag and Hand Rail—	

Lug, Cone Point, list Oct. 1, '99.....	75%10
Coach, Gimlet Point, list Oct. 1, '99.....	75%10

Hand Rail, list Jan. 1, '01.....	70%10
Jack Screws—	

Standard List.....	80%10
Millers Falls.....	50%10

Millers Falls, Roller.....	50%10
F. S. & W.....	70%10

Swett Iron Works.....	75%10
Machine—	

List Jan. 1, '98:	
Flat or Round Head, Iron.....	50%10

Flat or Round Head, Brass.....	50%10
Set and Cap—	

Set (Iron).....	80%
Set (Steel), net advance over Iron.....	25%

Sq. Hd. Cap.....	75%
Hex. Hd. Cap.....	75%

Ro. Hd. Cap.....	60%10
Fillister Hd. Cap.....	60%10

Wood—	
List July 23, 1903:	

Flat Head, Iron.....	87%10
Round Head, Iron.....	85%10

Flat Head, Brass.....	85%10
Round Head, Brass.....	85%10

Flat Head, Bronze.....	77%10
Round Head, Bronze.....	75%10

Drive Screws.....	87%10
Scroll Saws—	

See Saws, Scroll.	
Scythes—	

Grass, No. 1, Plain Finish.....	85.25
Chopper, Bronzed Webb.....	85.50

No. 3 Clipper, Folded Webb.....	86.75
No. 6 Clipper, Solid Steel.....	87.00

Bush, Weed & Bramble, No. 2.....	86.50
Grain, No. 1.....	83.25

Bronzed Webb, No. 1.....	83.50
No. 3 & 4 Clipper, Grain.....	83.75

Solid Steel No. 6.....	89.25
Seeders, Raisin—	

Enterprise.....	25%30
Sets—Awl and Tool—	

Alken's Sets, Awl and Tools:	
No. 20, 19 doz., \$10.00.....	60%10

Pray's Adj. Tool Handles.....	1, 112, 2, 118, 3, 112, 4, 112, 5, 112.....
O. E. Jennings & Co.'s Model Tool Holders.....	30%

Millers Falls Adj. Tool Handles, No. 1, 112; No. 4, 112.....	15%10
Ft. Madison Tree Plows, Hoe, Rake and Shovel.....	50%10

Sets, Nail—	
Octagon.....	35%10

Buck Bros.....	27%10
Cannon's Diamond Point.....	30%10

Mayhew's.....	30%10
Snell's Cor'rated Cup Pt.....	30%10

Snell's Knurled Cup Pt.....	30%10
Springfield Mach. Screw Co.:.....	30%10

Diamond Knurled Cup Pt.....	30%10
Rivet—	

Regular List.....	75%10
Saw—	

Alken's:	
Imitation.....	50%10

Imitation.....	50%10
Atkins:.....	40%

Criterion.....	40%
Adjustable.....	40%

Bemis & Call Co.'s:	
Cross Cut.....	30%

Plat.....	25%
Diston's Star and Monarch.....	25%

Morrill's No. 1, \$15.00.....	50%
No. 3 and 4, Cross Cut, \$20.00.....	50%

No. 5, Mill, \$30.00.....	50%
No. 10, 11, 12, \$15.00.....	50%

No. 1 Old Style, \$10.00.....	50%
Special, \$16.25.....	50%

Giant Royal Cross Cut.....	50%10
Royal, Hand.....	50%10

Talbot Positive.....	50%10
Shaving—	

Fox Shaving Sets, No. 30.....	50%10
Smith & Hemenway Co.'s.....	60%

Sharpeners, Knife—	
Chicago Wheel & Mfg. Co.....	70%

**Pike Mfg. Co.:**

Fast Cut Pocket Knife Hones.....	1.50
1 doz.....	1.50

Mounted Kitchen Sand Stone.....	1.50
1 doz.....	1.50

Natural Grit Carving Knife.....	3.00
Hones, 1 doz.....	3.00

Quick Cut Emery Carving Knife Hones.....	1.50
1 doz.....	1.50

Quick Edge Pocket Knife Hones.....	2.50
1 doz.....	2.50

Skate—	
Smith & Hemenway Co.....	20%

Shaves, Spoke—	
Iron.....	1.10

Wood.....	1.10
Bailey (Stanley R. & L. Co.).....	1.10

Brazor Edge (Stanley R. & L. Co.).....	1.10
Chapin-Stephens Co.....	1.10

Goodell's.....	1.10
Wood's F1 and F2.....	1.10

Shears—	
Cast Iron.....	1.10

Best.....	1.
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India Oil Stones (entire list).....33%  
 Quickcut Emery and Corundum Oil  
 Stone, Double Grit.....33%  
 Quickcut Emery and Corundum Oil  
 Stone, Double Grit.....33%  
 Quickcut Emery Rubbing Bricks.....33%  
 Hindostan No. 1, R. & L. 10 8¢  
 Hindostan No. 1, Small, 10 8¢  
 Axe Stones (all kinds).....2%  
 Turkey Oil Stones, Extra, 5 to  
 8 in.....3%  
 Queer Creek Stones, 4 to 8 in. 20¢  
 Queer Creek Slips.....40¢  
 Sand Stone.....6¢

**Scythe Stones—**  
 Chicago Wheel & Mfg. Co.:  
 Gem Corundum, 10 in., \$8.00  
 gro., 12 in., \$10.00  
 Norton Emery Scythe Stones:  
 Less than gross lots.....\$ gro. \$9.00  
 One gross or more.....\$ gro. \$7.20  
 Lots of 10 gross or more.....\$ gro. \$6.00  
 Pike Mfg. Co., 1901 list:  
 Black Diamond S. S. 8. 8. gro. \$12.00  
 Lamotte S. S. 8. 8. gro. \$11.00  
 White Mountain S. S. 8. 8. gro. \$9.00  
 Green Mountain S. S. 8. 8. gro. \$6.00  
 Extra Indian Pond S. S. 8. 8. gro. \$7.50  
 No. 1 Indian Pond S. S. 8. 8. gro. \$7.00  
 No. 2 Indian Pond S. S. 8. 8. gro. \$4.50  
 Leader Red End S. S. 8. 8. gro. \$4.50  
 Quick Cut Emery.....\$ gro. \$10.00  
 Pure Corundum.....\$ gro. \$18.00  
 Crescent.....\$7.00  
 Emery Scythe Rifles, 2 Coat, \$8  
 Emery Scythe Rifles, 3 Coat, \$10  
 Emery Scythe Rifles, 4 Coat, \$12  
 Balance of 1904 list 33%  
**Stoppers, Bottle—**  
 Victor Bottle Stoppers.....\$ gro. \$9.00

**Stops—Bench—**  
 Millers Falls.....15¢10¢  
 Morrill's, 30 doz., No. 1, \$10.00.....50¢  
 Morrill's, No. 2, \$12.50.....50¢

**Door—**  
 Chapin-Stephens Co.....60¢60¢10¢  
**Plane—**  
 Chapin-Stephens Co.....20¢  
**Straps—Box—**  
 Cary's Universal, case lots.....25¢20¢

**Hame—**  
 Covert's Saddlery Works.....60¢10¢  
**Stretchers, Carpet—**  
 Cast Iron, Steel Points, doz.  
 60¢60¢10¢  
 Socket.....doz. \$1.00

Excelsior Stretcher and Tack Ham-  
 mer Combined, 3 doz., \$6.00.....20¢  
**Stuffers, Sausage—**  
 Enterprise Mfg. Co.....25¢25¢74¢  
 National Specialty Co., list Jan.  
 1902.....30¢5¢

**Sweepers, Carpet—**  
 National Sweeper Co.:  
 Louis XV, Roller Bearing, Gold  
 Plated.....\$120.00  
 Hepplewhite, Roller Bearing, Sil-  
 ver Plated.....\$72.00  
 Rheraton, Roller Bearing, N'kel \$60.00  
 Ye Mission, Roller Bearing, Ox-  
 idized Coppered.....\$36.00  
 Transparent, Roller Bearing, Plate  
 Glass top, Nickel.....\$36.00  
 National Queen, Roller Bearing,  
 Fancy Veneers.....\$27.00  
 Loyal, Roller Bearing, Veneers,  
 Nickle.....\$25.00  
 Triple Medal, Roller Bearing,  
 Nickle.....\$24.00  
 Marion, Roller Bearing, N'kel \$24.00  
 Marion, Queen, Roller Bearing,  
 Nickle.....\$24.00  
 Monarch, Roller Bearing, N'kel \$22.00  
 Monarch, Roller Bearing, Jap. \$20.00  
 Perpetual, Regular B'r'gs, N'kel \$20.00  
 Perpetual, Regular B'r'gs, Jap. \$18.00  
 Monarch Extra (17 in. case), Roller  
 Bearing, Nickle.....\$36.00  
 Monarch Extra (17 in. case), Roller  
 Bearing, Japanned.....\$33.00  
 Auditorium (26 in. case), Roller  
 Bearing, Nickle.....\$54.00  
 Mammoth (30 in. case), Roller  
 Bearing, Nickle.....\$60.00

**NOTE—Rebates:** 50¢ per dozen on  
 three-dozen lots; \$1 per dozen on five-  
 dozen lots; \$2 per dozen on ten-dozen lots;  
 \$2.50 per dozen on twenty-five-dozen lots.

**Streator Metal Stamping Co.:**  
 Model E, Sanitaire.....\$ doz \$25.00  
 Model A, Sterling.....\$ doz \$25.00  
 Model B, Sterling, Nickle.....\$ doz \$23.00  
 Model B, Sterling, Japanned.....\$ doz \$21.00  
 Model C, Sterling.....\$ doz \$21.50  
 Model D, Sterling.....\$ doz \$19.50

**Tacks, Finishing Nails,  
 &c.**

**New List, May 1, 1905.**  
 American Carpet Tacks.....90¢57%  
 American Cut Tacks.....90¢57%  
 Suedes Cut Tacks.....90¢57%  
 Suedes Upholsterers' Tacks.....90¢57%

Gimp Tacks.....90¢50¢  
 Lace Tacks.....90¢50¢  
 Trimmers' Tacks.....90¢57%  
 Looking Glass Tacks.....65¢  
 Bill Posters' and Railroad Tacks.....90¢50¢  
 Hungarian Nails.....80¢  
 Finishing Nails.....70¢  
 Trunk and Clout Nails.....80¢5¢

**NOTE—The above prices are for  
 Standard Weights. An extra 5¢ is given  
 on Medium Weights, and an extra 10¢5¢  
 is given on light weights.**

**Miscellaneous—**  
 Double Pointed Tacks.....90¢6¢ or 7¢ens  
 Steel Wire Brads, R. & E. Mfg. Co.'s  
 list.....50¢10¢60¢  
 See also Nails, Wire.

**Tanks, Oil—** Each.  
 Emerald, S. S. & Co.....30-gal. \$3.40  
 Emerald, S. S. & Co.....60-gal. \$4.25  
 Queen City, S. S. & Co.....30-gal. \$3.65  
 Queen City, S. S. & Co.....60-gal. \$4.50

**Tapes, Measuring—**  
 American Asses' Skin.....\$90¢—%

**Patent Leather.....25¢30¢5¢**  
 Steel.....33 1-3¢5¢  
**Chesterman's.....25¢25¢5¢**  
 Eddy Asses' Skin.....40¢10¢50¢  
 Eddy Patent Leather.....25¢30¢5¢  
 Eddy Steel.....40¢10¢10¢  
 Keuffel & Esser Co.:  
 Favorite, Ass Skin.....40¢10¢50¢  
 Favorite, Duck and Leather.....25¢5¢25¢10¢  
 Metallic and Steel, lower list.....35¢35¢5¢  
 Pocket.....35¢35¢5¢  
 Lufkin's:  
 Asses' Skin.....40¢10¢50¢  
 Metallic.....30¢30¢5¢  
 Patent Bend, Leather.....25¢5¢25¢10¢  
 Pocket.....40¢10¢40¢5¢  
 Steel.....33%¢35¢

**Teeth, Harrow—**  
 Steel Harrow Teeth, plain or  
 headed, 5/8-inch and larger.....  
 per 100 lbs. \$3.00

**Thermometers.....80¢10¢80¢10¢5¢**

**Ties, Bale—Steel Wire—**  
 Single Loop.....80¢2 1/2¢  
 Monitor, Cross Head, &c.....70¢

**Brick Ties.....55¢10¢**

**Tinners' Shears, &c.—**  
 See Shears, Tinners', &c.

**Tinware—**  
 Stamped, Japanned and Plated, sold  
 very generally at net prices.

**Tips, Safety Pole—**  
 Covert's Saddlery Works.....60¢10¢

**Tire Benders, Upsetters, &c.**  
 See Benders and Upsetters, Tire.

**Tools—Coopers—**  
 L. & I. J. White.....20¢20¢5¢

**Hay—**  
 Myers' Hay Tools.....50¢  
 Stowell's Hay Carriers.....50¢  
 Stowell's Hay Forks.....50¢  
 Stowell's Fork Pulleys.....50¢

**Miniature—**  
 Smith & Hemenway Co.....25¢

**Saw—**  
 Atkins' Cross Cut Saw Tools.....40¢  
 Simonds' Improved.....33%  
 Simonds' Crescent.....25¢

**Ship—**  
 L. & I. J. White.....25¢

**Transom Lifters—**  
 See Lifters, Transom.

**Traps—Fly—**  
 Balloon, Globe or Acme, doz.  
 \$1.15¢1.25; gro. \$11.50¢12.00

Harper, Champion or Paragon,  
 doz. \$1.25¢1.40; gro. \$13.00¢13.50

**Game—**  
 Imitation Onocida.....75¢75¢5¢  
 Newhouse.....40¢40¢5¢  
 Hawley & Norton.....65¢  
 Victor.....70¢10¢  
 Onocida Community Jump.....50¢

**Mouse and Rat—**  
 Mouse, Wood, Choker, doz. holes  
 8 1/2¢9¢

Mouse, Round or Square Wire,  
 doz. 85¢90¢

Marty French Rat and Mouse Traps  
 (Genuine):  
 No. 1, Rat, each \$1.21; 3 doz. \$13.25  
 No. 5, Rat, 3 doz. \$6.50; case of 50  
 \$5.75 doz.

No. 3 1/2, Rat, 3 doz. \$5.25; case of 72  
 \$4.70 doz.

No. 4, Mouse, 3 doz. \$3.85; case of 150  
 \$3.00 doz.

No. 5, Mouse, 3 doz. \$3.00; case of 150  
 \$2.25 doz.

**Trimmers, Spoke—**  
 Wood's E. I.....50%

**Trowels**  
 Diston Brick and Pointing.....30¢  
 Diston Plastering.....25¢  
 Diston "Standard Brand" and Gar-  
 den Trowels.....35¢  
 Kohler's Steel Garden Trowels, 5 in.  
 6 in. 8 in. 10 in. 12 in. 14 in. 16 in.  
 18 in. 20 in. 22 in. 24 in. 26 in. 28 in.  
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 990 in. 992 in. 994 in. 996 in. 998 in. 1000 in.

**Trimmers, Spoke—**  
 Wood's E. I.....50%

**Trowels**  
 Diston Brick and Pointing.....30¢  
 Diston Plastering.....25¢  
 Diston "Standard Brand" and Gar-  
 den Trowels.....35¢  
 Kohler's Steel Garden Trowels, 5 in.  
 6 in. 8 in. 10 in. 12 in. 14 in. 16 in.  
 18 in. 20 in. 22 in. 24 in. 26 in. 28 in.  
 30 in. 32 in. 34 in. 36 in. 38 in. 40 in.  
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**Trimmers, Spoke—**  
 Wood's E. I.....50%

**Trowels**  
 Diston Brick and Pointing.....30¢  
 Diston Plastering.....25¢  
 Diston "Standard Brand" and Gar-  
 den Trowels.....35¢  
 Kohler's Steel Garden Trowels, 5 in.  
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# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trade

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

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New York, Thursday, November 16, 1905.

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Reading Matter Contents .....page 1342  
Alphabetical Index to Advertisers " 195  
Classified List of Advertisers.... " 187  
Advertising and Subscription Rates " 194

## COMPRESSION SHAFT COUPLINGS

Manufactured by  
FORSTER PULLEY  
WORKS,  
Cuba, N. Y.

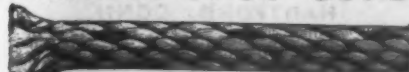


The American Mfg. Co.  
Ropes and Twines  
65 Wall Street, New York



THE BRISTOL COMPANY,  
Waterbury, Conn.  
**Bristol's Recording  
Instruments.**  
For Pressure, Temperature  
and Electricity.  
Gold Medal, St. Louis Exposition  
All Ranges, Low Prices, and Guar-  
anteed. Send for Circulars.

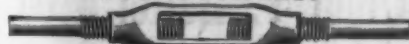
## SAMSON SPOT CORD



Also Linen and Italian Hemp  
Sash Cord.

SAMSON CORDAGE WORKS, Boston, Mass.

## TURNBUCKLES.



Branch Office, 11 Broadway, New York.  
Cleveland City Forge and Iron Co., Cleveland, O.



**DROP  
HAMMER**  
MERRILL  
BROS.  
Brooklyn, N. Y.

**COKE PILLING & CRANE**  
Girard Building, Philada.  
Farmers' Bank, Pittsburg.  
Empire Bldg., New York.  
Board of Trade, Boston.



## ROOFING TIN

on a man's roof takes the fear  
of the elements off his mind.

See

AMERICAN  
SHEET & TIN PLATE  
COMPANY'S

Advertisement on page 14.



## U.M.C.

## CARTRIDGES and SHOT SHELLS

are sold by both the largest and smallest retailers, because  
discriminating sportsmen demand "The Best"—U. M. C.:

U. M. C. products are easy to sell because of the quality  
and thorough advertising behind them. The selling sys-  
tem of the U. M. C. Co. protects all classes of dealers.  
Wide-awake dealers keep well stocked with U. M. C.  
Metallics and Shot Shells.

**The Union Metallic Cartridge Company,**  
BRIDGEPORT, CONN.

Agency, 515 Broadway, New York City.  
Depot, 86-88 First St., San Francisco, Cal.

## STIRLING CONSOLIDATED BOILER CO. See Page 46

## Capewell Horse Nails in Japan

THE  
BEST  
IN

THE CAPEWELL HORSE NAIL CO.,

Gentlemen:

This is to certify that I have used the Capewell horse nail  
for several years and find that it is good in quality, drives well,  
never breaks and keeps long. I have no hesitation in asserting that  
the Capewell nail is incomparably the best.

S. ASABA,

Veterinary Surgeon,

Licensed by the Minister of Agriculture and Commerce,

Atsuki Machi, Kanagawa Ken.

THE  
WORLD

Made by **The Capewell Horse Nail Co.** Hartford, Conn.



## JENKINS BROS. VALVES

are manufactured from the highest grades of material, and each valve  
is carefully tested before leaving the factory.

They are absolutely guaranteed.

All genuine bear our Trade Mark as shown in the cut.

Send for booklet, "VALVE TROUBLES AND HOW TO AVOID THEM."

JENKINS BROS., New York, Boston, Philadelphia, Chicago, London.

## "Swedoh" Cold Rolled Steel is unexcelled for Drawing and Stamping

THE AMERICAN TUBE & STAMPING COMPANY  
Water and Rail Delivery) BRIDGEPORT, CONN.

SEE  
PAGE 14.



## MAGNOLIA METAL.

Best Anti-Friction Metal for all Machinery Bearings.

Fac-Simile of Bar.  
Beware of  
imitations.

MAGNOLIA METAL CO.

Owners and Sole Manufacturers,  
Chicago, Fisher Bldg.

113-115 Bank Street,  
NEW YORK.

San Francisco, Montreal and Pittsburg.  
We manufacture all grades of Rabbitt Metals at  
competitive prices.



India Oil Stones (entire list).....33%  
 Quickcut Emery and Corundum Oil  
 Stone, Double Grit.....33%  
 Quickcut Emery and Corundum Axe  
 Stone, Double Grit.....33%  
 Quickcut Emery Rubbing Bricks.....33%  
 Hindostan No. 1, R's lat. 1 lb 10¢  
 Hindostan No. 1, Small, 1 lb 10¢  
 Axe Stones (all kinds).....33%  
 Turkey Oil Stones, Extra, 5 to  
 8 in.....1 lb 80¢  
 Queer Creek Stones, 4 to 8 in.....20¢  
 Queer Creek Slips.....1 lb 20¢  
 Sand Stone.....6¢

### Scythe Stones—

Chicago Wheel & Mfg. Co.:  
 Gem Corundum, 10 in., \$8.00  
 gro., 12 in., \$10.80  
 Norton Emery Scythe Stones:  
 Less than gross lots.....\$ gro. \$9.00  
 One gross or more.....\$ gro. \$7.20  
 Lots of 10 gross or more.....\$ gro. \$6.00  
 Pike Mfg. Co., 1901 list:  
 Black Diamond S. S., 8 in. gro. \$12.00  
 Lamolite S. S., 8 in. gro. \$11.00  
 White Mountain S. S., 8 in. gro. \$9.00  
 Green Mountain S. S., 8 in. gro. \$9.00  
 Extra Indian Pond S. S., 8 in. gro. \$5.50  
 No. 1 Indian Pond S. S., 8 in. gro. \$4.50  
 No. 2 Indian Pond S. S., 8 in. gro. \$4.00  
 Leader Red End S. S., 8 in. gro. \$4.50  
 Quick Cut Emery.....\$ gro. \$10.00  
 Pure Corundum.....\$ gro. \$18.00  
 Crescent.....\$7.00  
 Emery Scythe Rifles, 2 Coat, \$10  
 Emery Scythe Rifles, 3 Coat, \$10  
 Emery Scythe Rifles, 4 Coat, \$12  
 Balance of 1904 list 33%

### Stoppers, Bottle—

Victor Bottle Stoppers.....\$ gro. \$9.00

### Stops—Bench—

Millers Falls.....15¢-10¢  
 Morrill's, 3 doz. No. 1, \$10.00.....50¢  
 Morrill's, No. 2, \$12.50.....50¢

### Door—

Chapin-Stephens Co.....60¢-60¢-10¢

### Plane—

Chapin-Stephens Co.....20%

### Straps—Box—

Cary's Universal, case lots.....25¢-20¢

### Hame—

Covert's Saddlery Works.....60¢-10¢

### Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60¢-60¢-10¢

Socket.....doz. \$1.00

Excelsior Stretcher and Tack Hammer Combined, doz. \$6.00.....20%

### Stuffers, Sausage—

Enterprise Mfg. Co.....25¢-25¢-7½¢

National Specialty Co., list Jan. 1, 1902.....30¢-35¢

### Sweepers, Carpet—

National Sweeper Co.:  
 Louis XV, Roller Bearing, Gold Plated.....\$120.00  
 Hepplewhite, Roller Bearing, Silver Plated.....\$72.00  
 Sheraton, Roller Bearing, N'kel \$60.00  
 Ye Mission, Roller Bearing, Oxidized Coppered.....\$36.00  
 Transparent, Roller Bearing, Plate Glass top, Nickelized.....\$36.00  
 National Queen, Roller Bearing, Fancy Veneers.....\$27.00  
 Loyal, Roller Bearing, Veneers.....\$25.00  
 Triple Medal, Roller Bearing, Nickelized.....\$24.00  
 Marion, Roller Bearing, N'kel \$24.00  
 Marion Queen, Roller Bearing, Nickelized.....\$24.00  
 Monarch, Roller Bearing, N'kel \$22.00  
 Monarch, Roller Bearing, Jap. \$20.00  
 Perpetual, Regular B'g, N'kel \$20.00  
 Monarch Extra (17 in. case), Roller Bearing, Nickelized.....\$36.00  
 Monarch Extra (17 in. case), Roller Bearing, Japanned.....\$33.00  
 Auditorium (26 in. case), Roller Bearing, Nickelized.....\$54.00  
 Mammoth (30 in. case), Roller Bearing, Nickelized.....\$60.00

NOTE—Rebates: 50¢ per dozen on three-dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:  
 Model E, Sanitaire.....\$ doz \$25.00  
 Model A, Sterling.....\$ doz \$25.00  
 Model B, Sterling, Nickelized.....\$ doz \$23.00  
 Model B, Sterling, Japanned.....\$ doz \$22.00  
 Model C, Sterling.....\$ doz \$22.00  
 Model D, Sterling.....\$ doz \$19.50

Tacks, Finishing Nails, &c.

### New List, May 1, 1905.

American Carpet Tacks.....90¢-37½¢

American Cut Tacks.....90¢-37½¢

Suedes Cut Tacks.....90¢-37½¢

Suedes Upholsterers' Tacks.....90¢-37½¢

Gimp Tacks.....90¢-37½¢

Lace Tacks.....90¢-37½¢

Trimmers' Tacks.....90¢-37½¢

Looking Glass Tacks.....65¢

Bill Posters and Railroad Tacks.....90¢-37½¢

Hungarian Nails.....85¢

Finishing Nails.....70¢

Trunk and Clout Nails.....90¢-37½¢

NOTE—The above prices are for Standard Weights. An extra 3% is given on Medium Weights, and an extra 10% is given on light weights.

### Miscellaneous—

Double Pointed Tacks.....90¢-37½¢

Steel Wire Brads, R. & E. Mfg. Co.'s list.....50¢-10¢-60%

See also Nails, Wire.

### Tanks, Oil—

Emerald, S. S. & Co.....30-gal. \$3.40

Emerald, S. S. & Co.....60-gal. \$4.25

Queen City, S. S. & Co.....30-gal. \$3.65

Queen City, S. S. & Co.....60-gal. \$4.50

### Tapes, Measuring—

American Asses' Skin.....\$60¢-%

Patent Leather.....25¢-30¢-5¢  
 Steel.....33 1/3-35¢  
 Chesterman's.....25¢-25¢-5¢  
 Eddy Asses' Skin.....10¢-10¢-50¢  
 Eddy Patent Leather.....25¢-30¢-5¢  
 Eddy Steel.....40¢-40¢-10¢  
 Kenuff & Esmer Co.:  
 Favorite, Ass Skin.....40¢-10¢-50¢  
 Favorite, Duck and Leather.....25¢-30¢-5¢-10¢

Metallic and Steel, lower list.....35¢-35¢-5¢

Pocket.....35¢-35¢-5¢

Lufkin's:  
 Asses' Skin.....40¢-10¢-50¢

Metallic.....30¢-30¢-5¢-10¢

Patent Bend, Leather.....25¢-30¢-5¢-10¢

Pocket.....40¢-40¢-5¢

Steel.....33 1/3-35¢

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 1/2-inch and larger.....per 100 lbs. \$3.00

Thermometers—

Tin Case.....80¢-10¢-80¢-10¢-5¢

Ties, Bale—Steel Wire—

Single Loop.....80¢-10¢-5¢

Monitor, Cross Head, &c.....70%

Brick Ties—

Niagara Brick Ties.....25¢-10%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Piced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60¢-10%

Tire Benders, Upsetters, &c.—

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White.....20¢-25¢

Hay—

Myers' Hay Tools.....50%

Stowell's Hay Carriers.....50%

Stowell's Hay Forks.....50%

Stowell's Fork Pullers.....50%

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%

Simonds' Improved.....33 1/3%

Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Ballon, Globe or Acme, doz. \$1.15¢-1.25; gro. \$11.50¢-12.00

Harper, Champion or Paragon, doz. \$1.25¢-1.40; gro. \$13.00¢-13.50

Game—

Imitation Onaida.....75¢-75¢-5¢

Newhouse.....40¢-40¢-5¢

Hayley & Norton.....70¢-10%

Victor.....70¢-10%

Onaida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8 1/4¢-9¢

Mouse, Round or Square Wire, doz. 85¢-90¢

Marty French Rat and Mouse Traps (Genuine):  
 No. 1, Rat, each \$1.21; doz. \$13.25  
 No. 3, Rat, doz. \$4.50; case of 50 \$5.75  
 No. 3 1/2, Rat, doz. \$5.25; case of 50 \$6.75  
 No. 4, Mouse, doz. \$3.85; case of 150 \$3.00  
 No. 5, Mouse, doz. \$3.00; case of 150 \$2.25

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Diston Brick and Pointing.....30%

Diston Plastering.....25%

Diston "Standard Brand" and Garden Trowels.....25%

Kohler's Steel Garden Trowels, 6 in. 30¢-30¢-60%

Kohler's Steel Garden Trowels, 6 in. 30¢-30¢-60%

Never-Break Steel Garden Trowels.....\$ gro. \$6.00

Rose Brick and Plastering.....25¢-5¢

Woodrough & McParlin, Plastering.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:  
 New York Pattern.....50¢-10%

Western Pattern.....60¢-10%

Handy Trucks.....\$ doz. \$16.00

Grocery.....\$ doz. \$15.00

Daisy Stove Trucks, Improved Pattern.....\$ doz. \$18.50

McKinney Trucks.....each \$10.00

Model Stove Trucks.....\$ doz. \$18.50

Tubs, Wash—No. 1 2 3

Galvanized, per doz. \$4.25 4.75 5.25

Galvanized Wash Tubs (S. S. & Co.):  
 No. 1 2 3 10 20 30

Per doz. net \$5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine: BC. B.  
 No. 9, 1/4 and 1/2-lb. Balls. 22¢-24¢

No. 12, 1/4 and 1/2-lb. Balls. 18¢-20¢

No. 15, 1/4 and 1/2-lb. Balls. 16¢-18¢

No. 21, 1/4 and 1/2-lb. Balls. 16¢-18¢

No. 36, 1/4 and 1/2-lb. Balls. 15¢-17¢

Chalk Line, Cotton 1/2-lb. Balls.....25¢-30¢

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10¢-18¢

Cotton Wrapping, 5 Balls to lb., according to quality.....14¢-20¢

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls.....13¢-14¢

American 3-Ply Hemp, 1-lb. Balls.....13¢-14¢

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine).....9¢-10¢

India 3-Ply Hemp, 1-lb. Balls.....9¢-10¢

India 3-Ply Hemp, 1/2-lb. Balls.....7¢-8¢

2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls.....9¢-10¢

Mason Line, Linen, 1/2-lb. Bls. 46¢  
 No. 26 Mattress, 1/4 and 1/2-lb. Balls.....37¢  
 Wool, 3 to 6 ply.....B 5¢; A 6¢

### Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:  
 Simpson's Adjustable.....40%

Standard.....40%

Amateur.....25%

Columbian Hdw. Co.....10%

Emmet Universal:  
 Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.

Machinist and Tool Makers' No. 4A, \$12.50; No. 5A, \$7.00; No. 6A, \$10.00; No. 10A, \$22.50.

Presto Quick Acting.....25¢-25¢-5¢

Tiger Machinists.....40%

Fisher & Norris Double Screw. 15¢-10¢

Hollands:  
 Machinists.....40¢-40¢-5¢

Keystone.....65¢-67¢

Lewis Tool Co.:  
 Adjustable Jaw.....30%

Monarch.....50%

Solid Jaw.....20%

Merrill's.....20%

Millers Falls.....60¢-10%

Massey Vise Co.:  
 Clincher.....40%

Perfect.....20%

Lightning Grip.....30%

Parker's:  
 Victor.....20¢-25%

Regulars.....20¢-25%

Vulcan's.....40¢-45%

Combination Pipe.....55¢-60%

Prentiss.....20¢-25%

Sargent's.....20¢-25%

Snediker's X. L.....33 1/3%

Stephens.....33 1/3%

Williamson Mfg Co. Double Swivel.....40¢-5%

Saw Filers—

Diston's D 3 Clamp and Guide, doz. \$30.....25%

Perfection Saw Clamps, doz. \$1.50.....60%

Reading.....40%

Wentworth's Rubber Jaw, Nos. 1 and 3.....45¢-50%

Wood Workers—

Massey Vise Co.:  
 Lightning Grip.....15%

Perfect.....15%

Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.

Miscellaneous—

Bigall & Keeler Combination Pipe Vise.....60¢-10%

Holland's Combination Pipe.....60¢-60¢-5¢

Massey's Quick Action Pipe.....40%

Parker's Combination Pipe:  
 87 Series.....60%

187 Series.....60%

No. 870.....40%

Williamson Mfg Co. Double Swivel Combination Pipe.....40¢-5%

Wads—Price per M.

B. E., 11 up.....60¢

B. E., 9 and 10.....70¢

B. E., 8.....80¢

B. E., 7.....80¢

P. E., 11 up.....\$1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger \$1.70¢-1.75

Ely's P. E., 12 to 20.....\$3.00¢-3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:  
 Enamelled.....55%

Ground.....60%

Plain or Unground.....65%

Country Hollow Ware, per 100 lbs.....\$2.75

White Enamelled Ware:  
 Maslin Kettles.....70%

Covered Wares.....40%

Tinned and Turned.....50%

